To: James Cashwell
From: Chris Ricardi
Date: June 21, 2012
Subject: Interim Response Steps Work Plan Slurry Wall Monitoring Program 1Q12 – February/March 2012

DATA VALIDATION REPORT
FEBRUARY/MARCH 2012 SLURRY WALL GROUNDWATER AND SURFACE WATER
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS

TestAmerica Laboratories Data Sets: 360-39255-1, 360-39262-1, 360-39434-1, and 360-39540-1

1.0 INTRODUCTION

Groundwater and surface water samples were collected from the Olin Chemical Superfund Site from February 22 to March 12, 2012. Samples were analyzed by TestAmerica Laboratories in Westfield, Massachusetts. Data were reported in sample delivery groups (SDGs) 360-39255-1, 360-39262-1, 360-39434-1 and 360-39540-1. A summary of samples included in this review is contained in Table 1. Samples reviewed in this report were analyzed for the following USEPA SW-846 (USEPA, 1996), USEPA wastewater (USEPA, 1993), or Standard Methods (APHA, 1995):

- dissolved metals (aluminum and chromium) by USEPA Method 6010C in groundwater
- dissolved and total metals (aluminum, chromium, and sodium) by USEPA Method 6010C in surface water
- general chemistry analyses for ammonia by USEPA Method 350.1 (Lachat 10-107-06-1B), chloride, nitrate, nitrite, and sulfate by USEPA Method 300, and specific conductance by SM 2510B

The Final Interim Response Steps Work Plan (MACTEC, 2007) and the MassDEP Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP) [MassDEP, 2010] were used as references during the review. Analytical packages were reviewed using the Level 1 Data Quality Evaluation checklists that were developed for the Olin Wilmington monitoring tasks. Final sample results are presented on data summaries in Table 2. A summary of validation qualification actions is presented on Table 3 for results that were qualified. Validation reason codes are associated with final results that have been qualified as indicated in Table 3.

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With the exception of the data qualification items discussed in the sections below, results are determined to be usable as reported by the laboratory.

2.0 METALS

Data were reviewed for the following parameters:

* Data Completeness
* Holding Time
* Blanks
* Laboratory Control Sample/Laboratory Control Sample Duplicate Analysis
* Matrix Spike Analysis (groundwater only)
* Field Duplicate Results (groundwater only)
* Detection Limits

  Dissolved vs. Total Metals Comparison (surface water only)

* = indicates that criteria were met for this parameter

Dissolved vs. Total Metals Comparison

SDG 360-39255-1

Concentrations of sodium, aluminum, and chromium in the dissolved fraction were over ten percent greater than concentrations reported in the total fraction in a subset of surface water samples in SDG 360-39255-1 as presented in the table below. The results in these samples were qualified estimated (J).

Fraction	Lab Sample ID	Field Sample ID	Analyte	Analyte result (µg/L)	% Dissolved amount is greater than Total amount	Final Qualifier
Dissolved	360-39255-1	OC-ISCO3-SW	Sodium	88000	**14.3%**	J
Total	360-39255-1	OC-ISCO3-SW	Sodium	77000		J
Dissolved	360-39255-3	OC-SW-PZ16RR-SW	Aluminum	760	**18.8%**	J
Total	360-39255-3	OC-SW-PZ16RR-SW	Aluminum	640		J
Dissolved	360-39255-3	OC-SW-PZ16RR-SW	Sodium	170000	**13.3%**	J
Total	360-39255-3	OC-SW-PZ16RR-SW	Sodium	150000		J
Dissolved	360-39255-4	OC-SW-PZ-17RR-SW	Aluminum	1200	**20.0%**	J
Total	360-39255-4	OC-SW-PZ-17RR-SW	Aluminum	1000		J
Dissolved	360-39255-4	OC-SW-PZ-17RR-SW	Sodium	220000	**15.8%**	J
Total	360-39255-4	OC-SW-PZ-17RR-SW	Sodium	190000		J
Dissolved	360-39255-5	OC-SD-17-SW	Aluminum	890	**14.1%**	J
Total	360-39255-5	OC-SD-17-SW	Aluminum	780		J

Fraction	Lab Sample ID	Field Sample ID	Analyte	Analyte result (µg/L)	% Dissolved amount is greater than Total amount	Final Qualifier
Dissolved	360-39255-5	OC-SD-17-SW	Chromium	410	**10.8%**	J
Total	360-39255-5	OC-SD-17-SW	Chromium	370		J
Dissolved	360-39255-5	OC-SD-17-SW	Sodium	210000	**16.7%**	J
Total	360-39255-5	OC-SD-17-SW	Sodium	180000		J
Dissolved	360-39255-6	OC-PZ18R-SW	Sodium	120000	**22.4%**	J
Total	360-39255-6	OC-PZ18R-SW	Sodium	98000		J
Dissolved	360-39255-6	OC-PZ18R-SW	Aluminum	92	**12.2%**	J
Total	360-39255-6	OC-PZ18R-SW	Aluminum	82		J
Dissolved	360-39255-7	OC-ISCO1-SW	Sodium	120000	**20.0%**	J
Total	360-39255-7	OC-ISCO1-SW	Sodium	100000		J
Dissolved	360-39255-7	OC-ISCO1-SW	Aluminum	100	**17.6%**	J
Total	360-39255-7	OC-ISCO1-SW	Aluminum	85		J

3.0 GENERAL CHEMISTRY – Ammonia, Chloride, Sulfate, Nitrate, Nitrite, and Specific Conductance

Data were reviewed for the following parameters:

* Data Completeness
* Holding Time
* Blanks
  Matrix Spike Analysis (sulfate and chloride in groundwater only)
* Field Duplicate Analysis
* Laboratory Duplicate Analysis
* Laboratory Control Sample/Laboratory Control Sample Duplicate Analysis
  Detection Limits

***** **=** indicates that criteria were met for this parameter

Matrix Spikes

SDG 360-39262-1

Sample OC-GW-202S was submitted for matrix spike analysis. The percent recoveries of sulfate (137) and chloride (126) were above the upper control of 125. The relative percent difference (RPD) between the percent recovery in the MS and MSD was 21 and above the control limit of 20. Results for chloride and sulfate were qualified estimated (J) in sample OC-GW-202S and the associated field duplicate, OC-GW-202SDUP.

Detection Limits

SDG 360-39255-1

Nitrite quantitation limits were reported above the project goal of 0.01 mg/L due to dilution in the following samples:

SDG	lab_sample_id	field_sample_id	param_name	final_result (mg/l)	Final Qual	dilution _factor
360-39255-1	360-39255-1	OC-ISCO3-SW	Nitrite as N	0.1	U	10
360-39255-1	360-39255-2	OC-ISCO2-SW	Nitrite as N	0.1	U	10
360-39255-1	360-39255-3	OC-SW-PZ16RR-SW	Nitrite as N	0.1	U	10
360-39255-1	360-39255-4	OC-SW-PZ-17RR-SW	Nitrite as N	0.1	U	10
360-39255-1	360-39255-5	OC-SD-17-SW	Nitrite as N	0.1	U	10
360-39255-1	360-39255-6	OC-PZ18R-SW	Nitrite as N	0.1	U	10
360-39255-1	360-39255-7	OC-ISCO1-SW	Nitrite as N	0.1	U	10

Unless discussed above, sample results are interpreted to be usable as reported by TestAmerica.

Chris Ricardi

Chris Ricardi, NRCC-EAC
Senior Chemist

6/21/2012
Date

Michael Murphy
Project Principal

6/26/12
Date

References:

American Public Health Association (APHA), 1995. "Standard Methods for Examination of Water and Wastewater"; 19th Edition; APHA, 1015 Fifteenth St., NW. Washington, D.C. 20005.

MACTEC Engineering and Consulting, Inc. (MACTEC), 2007. "Final Interim Response Steps Work Plan"; Olin Chemical Superfund Site; 51 Eames Street, Wilmington, Massachusetts; August 8.

Massachusetts Department of Environmental Protection (MassDEP), 2010. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; July.

U.S. Environmental Protection Agency (USEPA), 1993. "Methods for Chemical Analysis and Water and Wastes (MCAWW)", EPA/600/4-79-020 (March 1983) with updates and supplements EPA/600/4-91-010 (June 1991), EPA/600/R-92-129 (August 1992) and EPA/600/R-93-100 (August 1993).

USEPA, 1996. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Emergency Response; Washington, DC; SW-846; November 1986; Revision 4 -December 1996.

Table 1
Sample Summary
Data Validation Report
February/March 2012 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

Lab Sample ID	Location	Sample ID	Sample Date	SW846 6010C Total Metals	SW846 6010C Filtered Metals	E350.1 (QuickChem 10-107-06-1-B) Ammonia	A2510B Conductivity	40CFR136A 300.0 Anions
Groundwater								
360-39262-1	GW-202D	OC-GW-202D	2/22/2012		2	1	1	2
360-39262-2	GW-202S	OC-GW-202S	2/22/2012		2	1	1	2
360-39262-3	GW-202S	OC-GW-202S DUP	2/22/2012		2	1	1	2
360-39262-4	PZ-25	OC-PZ-25	2/22/2012		2	1	1	2
360-39262-5	PZ-24	OC-PZ-24	2/22/2012		2	1	1	2
360-39434-2	GW-79S	OC-GW 79S	3/7/2012		2	1	1	2
360-39434-3	PZ-16RR	OC-PZ 16RR	3/7/2012		2	1	1	2
360-39540-1	GW-78S	OC-GW-78S	3/12/2012		2	1	1	2
360-39540-2	PZ-17RR	OC-PZ-17-RR	3/12/2012		2	1	1	2
360-39540-3	GW-25	OC-GW-25	3/12/2012		2	1	1	2
360-39540-4	PZ-18R	OC-PZ-18R	3/12/2012		2	1	1	2
Surface Water								
360-39255-1	ISCO3	OC-ISCO3-SW	2/23/2012	3	3	1	1	4
360-39255-2	ISCO2	OC-ISCO2-SW	2/23/2012	3	3	1	1	4
360-39255-3	PZ-16RR	OC-SW-PZ16RR-SW	2/23/2012	3	3	1	1	4
360-39255-4	PZ-17RR	OC-SW-PZ-17RR-SW	2/23/2012	3	3	1	1	4
360-39255-5	SD-17	OC-SD-17-SW	2/23/2012	3	3	1	1	4
360-39255-6	PZ-18R	OC-PZ18R-SW	2/23/2012	3	3	1	1	4
360-39255-7	ISCO1	OC-ISCO1-SW	2/23/2012	3	3	1	1	4

Notes:
Number listed under method indicates number of target analytes reported.

Prepared by / Date: KJC 03/30/12
Checked by / Date: TLC 05/07/12

Table 2
Final Results Summary
February/March 2012 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	GW-202D		GW-202S		GW-202S		GW-25		GW-78S		GW-79S		PZ-16RR		PZ-17RR	
			Field Sample ID	OC-GW-202D		OC-GW-202S		OC-GW-202SDUP		OC-GW-25		OC-GW-78S		OC-GW 79S		OC-PZ 16RR		OC-PZ-17-RR	
			Field Sample Date	02/22/12		02/22/12		02/22/12		03/12/12		03/12/12		03/07/12		03/07/12		03/12/12	
			QC Code	FS		FS		FD		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	360-39262-1		360-39262-1		360-39262-1		360-39540-1		360-39540-1		360-39434-1		360-39434-1		360-39540-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	14000		100	U	100	U	100	U	100	U	16	J	100	U	100	U
F	SW6010	Chromium	ug/l	980		3.3	J	3.4	J	3.1	J	5.1		5.6		5.3		5.1	
N	E300	Chloride	mg/l	280		47	J	46	J	69		27		180		130		22	
N	E300	Sulfate	mg/l	1800		360	J	350	J	100		490		1200		740		460	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	310		73		66		50		53		140		110		53	
N	A2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	4500		1100		1100		660		1300		3000		2100		1300	

Notes:

N = normal

F = filtered

FS = field sample

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micromhos per centimeter

Table 2
Final Results Summary
February/March 2012 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	PZ-18R		PZ-24		PZ-25	
			Field Sample ID	OC-PZ-18R		OC-PZ-24		OC-PZ-25	
			Field Sample Date	03/12/12		02/22/12		02/22/12	
			QC Code	FS		FS		FS	
			Lab Sample Delivery Group	360-39540-1		360-39262-1		360-39262-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	100	U	100	U	100	U
F	SW6010	Chromium	ug/l	14		23		8	
N	E300	Chloride	mg/l	290		26		19	
N	E300	Sulfate	mg/l	790		720		460	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	140		60		46	
N	A2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	2600		1900		1300	

Notes:

Prepared by / Date: KJC 05/08/12

Checked by / Date: TLC 05/10/12

N = normal

F = filtered

FS = field sample

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micromhos per centimeter

Table 2
Final Results Summary
February/March 2012 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

			Loc Name	ISCO1		ISCO2		ISCO3		PZ-16RR		PZ-17RR		PZ-18R		SD-17	
			Field Sample ID	OC-ISCO1-SW		OC-ISCO2-SW		OC-ISCO3-SW		OC-SW-PZ16RR-SW		OC-SW-PZ-17RR-SW		OC-PZ18R-SW		OC-SD-17-SW	
			Field Sample Date	02/23/12		02/23/12		02/23/12		02/23/12		02/23/12		02/23/12		02/23/12	
			QC Code	FS		FS		FS		FS		FS		FS		FS	
			Lab Sample Delivery Group	360-39255-1		360-39255-1		360-39255-1		360-39255-1		360-39255-1		360-39255-1		360-39255-1	
Frac	**Method**	**Analyte**	**Units**	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	100	J	150		36	J	760	J	1200	J	92	J	890	J
F	SW6010	Chromium	ug/l	15		74		5	U	360		540		14		410	J
F	SW6010	Sodium	ug/l	120000	J	150000		88000	J	170000	J	220000	J	120000	J	210000	J
N	E300	Chloride	mg/l	140		130		140		160		220		140		210	
N	E300	Nitrate as N	mg/l	0.27		1.2		0.94		1.1		3.4		0.34		3.7	
N	E300	Nitrite as N	mg/l	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
N	E300	Sulfate	mg/l	170		420		36		470		550		180		460	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	44		92		2.4		100		89		51		77	
N	A2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	970		1500		670		1600		2000		1000		1800	
T	SW6010	Aluminum	ug/l	85	J	140		39	J	640	J	1000	J	82	J	780	J
T	SW6010	Chromium	ug/l	15		73		0.68	J	340		510		14		370	J
T	SW6010	Sodium	ug/l	100000	J	140000		77000	J	150000	J	190000	J	98000	J	180000	J

Notes:

N = normal

T = total (unfiltered)

F = filtered

FS = field sample

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micromhos per centimeter

Prepared by / Date: KJC 03/16/12

Checked by / Date: TLC 05/10/12

Table 3
Validation Qualification Action Summary
Data Validation Report
February/March 2012 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

SDG	Lab Sample ID	Analytical Method	Fraction	Field Sample ID	Parameter	Lab Result	Lab Qualifier	Final Result	Final Qualifier	Val Reason Code	Units
360-39255-1	360-39255-1	SW6010	T	OC-ISCO3-SW	Sodium	77000		77000	J	TD	ug/l
360-39255-1	360-39255-1	SW6010	F	OC-ISCO3-SW	Sodium	88000		88000	J	TD	ug/l
360-39255-1	360-39255-3	SW6010	F	OC-SW-PZ16RR-SW	Aluminum	760		760	J	TD	ug/l
360-39255-1	360-39255-3	SW6010	T	OC-SW-PZ16RR-SW	Aluminum	640		640	J	TD	ug/l
360-39255-1	360-39255-3	SW6010	F	OC-SW-PZ16RR-SW	Sodium	170000		170000	J	TD	ug/l
360-39255-1	360-39255-3	SW6010	T	OC-SW-PZ16RR-SW	Sodium	150000		150000	J	TD	ug/l
360-39255-1	360-39255-4	SW6010	T	OC-SW-PZ-17RR-SW	Aluminum	1000		1000	J	TD	ug/l
360-39255-1	360-39255-4	SW6010	F	OC-SW-PZ-17RR-SW	Aluminum	1200		1200	J	TD	ug/l
360-39255-1	360-39255-4	SW6010	F	OC-SW-PZ-17RR-SW	Sodium	220000		220000	J	TD	ug/l
360-39255-1	360-39255-4	SW6010	T	OC-SW-PZ-17RR-SW	Sodium	190000		190000	J	TD	ug/l
360-39255-1	360-39255-5	SW6010	T	OC-SD-17-SW	Aluminum	780		780	J	TD	ug/l
360-39255-1	360-39255-5	SW6010	F	OC-SD-17-SW	Aluminum	890		890	J	TD	ug/l
360-39255-1	360-39255-5	SW6010	F	OC-SD-17-SW	Chromium	410		410	J	TD	ug/l
360-39255-1	360-39255-5	SW6010	T	OC-SD-17-SW	Chromium	370		370	J	TD	ug/l
360-39255-1	360-39255-5	SW6010	T	OC-SD-17-SW	Sodium	180000		180000	J	TD	ug/l
360-39255-1	360-39255-5	SW6010	F	OC-SD-17-SW	Sodium	210000		210000	J	TD	ug/l
360-39255-1	360-39255-6	SW6010	F	OC-PZ18R-SW	Aluminum	92	J	92	J	TD	ug/l
360-39255-1	360-39255-6	SW6010	T	OC-PZ18R-SW	Aluminum	82	J	82	J	TD	ug/l
360-39255-1	360-39255-6	SW6010	T	OC-PZ18R-SW	Sodium	98000		98000	J	TD	ug/l
360-39255-1	360-39255-6	SW6010	F	OC-PZ18R-SW	Sodium	120000		120000	J	TD	ug/l
360-39255-1	360-39255-7	SW6010	F	OC-ISCO1-SW	Aluminum	100		100	J	TD	ug/l
360-39255-1	360-39255-7	SW6010	T	OC-ISCO1-SW	Aluminum	85	J	85	J	TD	ug/l
360-39255-1	360-39255-7	SW6010	T	OC-ISCO1-SW	Sodium	100000		100000	J	TD	ug/l
360-39255-1	360-39255-7	SW6010	F	OC-ISCO1-SW	Sodium	120000		120000	J	TD	ug/l
360-39262-1	360-39262-2	E300	N	OC-GW-202S	Chloride	47		47	J	MS-H	mg/l
360-39262-1	360-39262-2	E300	N	OC-GW-202S	Sulfate	360		360	J	MS-H	mg/l
360-39262-1	360-39262-3	E300	N	OC-GW-202SDUP	Chloride	46		46	J	MS-H	mg/l
360-39262-1	360-39262-3	E300	N	OC-GW-202SDUP	Sulfate	350		350	J	MS-H	mg/l

Units:
ug/L = microgram per liter
mg/L = milligram per liter

Fraction
T = Total
F = Filtered
N = Not Applicable

Validation Qualifier:
J = Value is estimated

Validation Reason Codes:
MS-H = MS and/or MSD recovery high
TD = Dissolved concentration exceeds total concentration by greater than ten percent

Prepared by / Date: KJC 03/16/12
Checked by / Date: TLC 05/10/12

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

Reviewer/Date Tige Cunningham 3-14-12
Sr. Review/Date Chris Ricardi 6/7/12
Lab Report # 360-39255-1 360-39262-1, 360-39434-1, 360-39540-1
Project # G107120016.01.10

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? **Yes** [✓] No [ ] N/A [ ] Comments:
Check items received.

☑ *Name of Laboratory* ☑ *Address* ☑ *Project ID* ☑ *Phone #* ☑ *Sample identification – Field and Laboratory*
Client Information: ☑ *Name* ☑ *Address* ☑ *Client Contact* *(IDs must be cross-referenced)*

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement ***Yes*** [✓] *No* [ ] *N/A* [ ] *Comments:*

Does the laboratory report include a completed Analytical Report Certification in the required format?

***ACTION**: If no, contact lab for submission of missing certification or certification with correct format.*

1.3 Laboratory Case Narrative: ***Yes*** [✓] *No* [ ] *N/A* [ ] *Comments:*

☑ *Narrative serves as an exception report for the project and method QA/QC performance.* ☐ *Narrative includes an explanation of each discrepancy on the*

Certification Statement.

***ACTION**: If no, contact lab for submission of missing or illegible information.*

1.4 Chain of Custody (COC) copy present with all documentation completed **Yes** [✓] No [ ] N/A [ ] Comments:

NOTE: Olin receives and maintains the *original COC.*

ACTION: If no, contact lab for submission of copy of completed *COC.*

1.5 Sample Receipt Information (*Cooler Receipt Form present?*): Yes [✓] No [ ] N/A [ ] Comments:

Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

☑ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).

☑ Container type noted ☑ sample condition observed ☑ pH verified (where applicable) ☐ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were all samples delivered to the laboratory without breakage? **Yes** [✓] No [ ] N/A [ ] Comments:

1.5.2 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? Yes [ ] **No** [✓] N/A [ ] Comments:

1.6 Sample Results Section: *Was each of the following requirements supplied in the laboratory report for each sample?* **Yes** [✓] No [ ] N/A [ ] Comments:

☑ Field ID and Lab ID ☑ *Date and time collected* ☑ Analyst Initials ☑ *Dilution Factor* ☐ % moisture or solids (N/A) ☑ *Reporting limits*
☐ *Clean-up method* (N/A) ☑ Analysis method ☑ *Preparation method* ☑ *Date of preparation/extraction/digestion clean-up and analysis, where applicable*
☑ Matrix ☑ Target analytes and concentrations ☑ Units (soils must be reported in dry weight)

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was each of the following information supplied in the laboratory report for each sample batch? **Yes** [✓] No [ ] N/A [ ] Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

☑ Method blank results ☑ LCS recoveries ☐ MS/MSD recoveries and RPDs N/A ☑ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? Holding time for metals is 180 days from sample collection to analysis for both water and soil. Yes [ ] **No [✓]** N/A [ ] Comments:

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded, qualify all positive results (J) and non-detects (UJ). If grossly exceeded (2X holding time) reject (R) all non-detect results.

3.0 Laboratory Method

3.1 Was the correct laboratory method used? **Yes [✓]** No [ ] N/A [ ] Comments:

Water Digestion	3005A or 3010A or 3020A
Soil Digestion	3050B
Metals	6010B or 200.7

ACTION: If no, contact laboratory to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change and to request variance.

3.2 Are the practical quantitation limits the same as those specified by the ☑ SOW ☐ QAPP ☐ Lab ☐ MADEP **Yes [✓]** No [ ] N/A [ ] Comments:

NOTE: *Verify that the reported metals match the target list specified on the COC.*

ACTION: If no, evaluate variation with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are results present for each sample in the SDG? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If dilutions were required, were dilution factors reported? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact the lab for submission.

4.0 Method Blanks

4.1 Is the Method Blank Summary present? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, call the laboratory for submission of missing data.

4.2 Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact laboratory for justification. Consult senior chemist for action needed. Narrate non-compliance.

4.3 Is the method blank less than the PQLs for all target elements? **Yes** [✓] No [ ] N/A [ ] Comments:

NOTE: *MADEP requires the method blank to be matrix matched and digested with the samples*

4.4 Do any method blanks have positive results for metals? Qualify data according to the following: Yes [ ] **No** [✓] N/A [ ] Comments:

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = 5x the blank value) and the associated samples and qualifiers.

5.0 Laboratory Control Standard

5.1 Was a laboratory control standard run with each analytical batch of 20 samples or less?

Yes [✓] No [ ] N/A [ ] Comments:

NOTE: *A full target, second source LCS is required by MADEP.*
ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgement to evaluate data accuracy associated with that batch.

5.2 Is a LCS Summary Form present?

Yes [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is the recovery of any analyte outside of MADEP control limits?

Yes [ ] **No** [✓] N/A [ ] Comments:

Sample Type	MADEP % Rec
Water	80-120
Soil	within Lab generated limits

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and non-detects results within the batch as (J). If LCS recovery is <30%, positive and non-detect results are rejected (R).

Comments:

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs collected? List project samples that were spiked.

Yes [ ] No [✓] N/A [ ] Comments:

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present?

Yes [ ] No [ ] N/A [✓] Comments:

NOTE: *A full target, second source MS/MSD is required by MADEP.*
ACTION: If any matrix spike data are missing, call lab for resubmission.

6.3 Were matrix spikes analyzed as indicated on the COC and project schedule?

Yes [ ] No [ ] N/A [✓] Comments:

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

6.4 Are any metal spike recoveries outside of the QC limits?

Yes [ ] **No** [ ] N/A [✓] Comments:

Sample Type	***MADEP*** ***% Rec***	QAPP % Rec	Method
Water	*75-125*	N/A	6010B
Water	*N/A*	70-130	200.7
Soil	*75-125*	75-125	6010B

NOTE: $\%R = \frac{(SSR-SR)}{SA} \times 100\%$ Where: SSR = Spiked sample result, SR = Sample result, SA = Spike added

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits? Yes [ ] **No** [ ] N/A [✓] Comments:

NOTE: $RPD = \frac{S-D}{(S+D)/2} \times 100\%$ Where: S = MS sample result
D = MSD sample result

NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J).

7.0 Laboratory Duplicate

7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Duplicate Sample Form present? **Yes** [ ] No [✓] N/A [ ] Comments:

NOTE: *MADEP refers to this sample as a "matrix duplicate".*

ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance.

7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits? Yes [ ] **No** [✓] N/A [ ] Comments:

MADEP Laboratory Duplicate Sample RPD Criteria:	QAPP RPD
For aqueous results > 5× RL, RPD must be ± 20%	20
For aqueous results < 5× RL, RPD must be ≤ RL	20
For soil/sediment results > 5× RL, RPD must be ± 35%	20
For soil/sediment results < 5× RL, RPD must be ≤ 2× RL	20

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.

Yes [ ] No [✓] N/A [ ] Comments:

8.2 Do any rinsate blanks have positive results?

Yes [ ] **No [ ]** N/A [✓] Comments:

***NOTE**: MADEP does not require the collection of rinsate blanks.*

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes [✓] **No [✓]** N/A [ ] Comments:

→ SW collected
→ for GW

9.2 Were field duplicates collected per the required frequency? Yes [✓] No [ ] N/A [ ] Comments:

SOW ☐ QAPP *(1 per 10)* ☐ *MADEP Option 1 (1 per 20)* ☐ *MADEP Option 3 (1 per 10)* ☐

9.3 Was the RPD ≤ 50% for soils or waters? Calculate the RPD for all results and attach to this review. Yes [✓] No [ ] N/A [ ] Comments:

ACTION: RPD must be ≤50% for soil and water. Qualify data (J) for both sample results if the RPD exceeds 50%.

10.0 Special QA/QC

10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal. Yes [✓] **No** [ ] N/A [ ] Comments:

↳ For Surface water only

ACTION: If results for both total and dissolved are ≥ 5x the PQL **and** the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than 5x the PQL **and** the **difference** exceeds 2x the PQL, flag both results as estimated (J)

Sodium

Sample	Total	Dissolved	% Dissolved higher	Qual
OC-ISC03-SW	77000	88000	14%	JQual Both
OC-ISC02-SW	140000	150000	7%	none
OC-SW-PZ16RR-SW	150000	170000	13%	JQual Both
OC-SW-PZ-17RR-SW	190000	220000	15%	JQual Both

See attached table for remainder of samples

fraction	Lab Sample ID	Field Sample ID	Analyte	Analyte result (µg/L)	% Dissolved amount is greater than Total amount	Final Qualifier
Dissolved	360-39255-1	OC-ISCO3-SW	Sodium	88000	**14.3%**	J
Total	360-39255-1	OC-ISCO3-SW	Sodium	77000		J
Dissolved	360-39255-3	OC-SW-PZ16RR-SW	Aluminum	760	**18.8%**	J
Total	360-39255-3	OC-SW-PZ16RR-SW	Aluminum	640		J
Dissolved	360-39255-3	OC-SW-PZ16RR-SW	Sodium	170000	**13.3%**	J
Total	360-39255-3	OC-SW-PZ16RR-SW	Sodium	150000		J
Dissolved	360-39255-4	OC-SW-PZ-17RR-SW	Aluminum	1200	**20.0%**	J
Total	360-39255-4	OC-SW-PZ-17RR-SW	Aluminum	1000		J
Dissolved	360-39255-4	OC-SW-PZ-17RR-SW	Sodium	220000	**15.8%**	J
Total	360-39255-4	OC-SW-PZ-17RR-SW	Sodium	190000		J
Dissolved	360-39255-5	OC-SD-17-SW	Aluminum	890	**14.1%**	J
Total	360-39255-5	OC-SD-17-SW	Aluminum	780		J
Dissolved	360-39255-5	OC-SD-17-SW	Chromium	410	**10.8%**	J
Total	360-39255-5	OC-SD-17-SW	Chromium	370		J
Dissolved	360-39255-5	OC-SD-17-SW	Sodium	210000	**16.7%**	J
Total	360-39255-5	OC-SD-17-SW	Sodium	180000		J
Dissolved	360-39255-6	OC-PZ18R-SW	Sodium	120000	**22.4%**	J
Total	360-39255-6	OC-PZ18R-SW	Sodium	98000		J
Dissolved	360-39255-7	OC-ISCO1-SW	Sodium	120000	**20.0%**	J
Total	360-39255-7	OC-ISCO1-SW	Sodium	100000		J

Client Sample Results

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-ISCO3-SW
Date Collected: 02/23/12 07:20
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39255-1
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**39**	**J**	100	13	ug/L		02/24/12 09:45	02/27/12 12:54	1
Chromium	**0.68**	**J**	5.0	0.66	ug/L		02/24/12 09:45	02/27/12 12:54	1
Sodium	**77000**	J	2000	780	ug/L		02/24/12 09:45	03/06/12 15:47	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**36**	**J**	100	13	ug/L			03/06/12 16:39	1
Chromium	ND		5.0	0.66	ug/L			03/06/12 16:39	1
Sodium	**88000**	J	2000	780	ug/L			03/06/12 16:39	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	**0.94**		0.050	0.050	mg/L			02/24/12 16:53	1
Sulfate	**36**		2.0	2.0	mg/L			02/24/12 16:53	1
Chloride	**140**		10	10	mg/L			02/24/12 17:10	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 17:10	10
Ammonia	**2.4**		0.10	0.10	mg/L		02/27/12 10:48	02/27/12 15:34	1
Specific Conductance	**670**		1.0	1.0	umhos/cm			03/01/12 09:29	1

3/14/12
TC

Client Sample Results

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-SW-PZ16RR-SW
Date Collected: 02/23/12 08:00
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39255-3
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	640	J	100	13	ug/L		02/24/12 09:45	02/27/12 13:00	1
Chromium	340		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:00	1
Sodium	150000	J	2000	780	ug/L		02/24/12 09:45	03/06/12 15:54	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	760	J	100	13	ug/L			03/06/12 16:51	1
Chromium	360		5.0	0.66	ug/L			03/06/12 16:51	1
Sodium	170000	J	2000	780	ug/L			03/06/12 16:51	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	1.1		0.050	0.050	mg/L			02/24/12 18:02	1
Sulfate	470		20	20	mg/L			02/24/12 18:53	10
Chloride	160		10	10	mg/L			02/24/12 18:53	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 18:53	10
Ammonia	100		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:53	10
Specific Conductance	1600		1.0	1.0	umhos/cm			03/01/12 09:32	1

3/14/12
TC

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-SW-PZ-17RR-SW
Date Collected: 02/23/12 08:20
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39255-4
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	1000	J	100	13	ug/L		02/24/12 09:45	02/27/12 13:09	1
Chromium	510		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:09	1
Sodium	190000	J	2000	780	ug/L		02/24/12 09:45	03/06/12 15:57	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	1200	J	100	13	ug/L			03/06/12 16:54	1
Chromium	540		5.0	0.66	ug/L			03/06/12 16:54	1
Sodium	220000	J	2000	780	ug/L			03/06/12 16:54	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	3.4		0.050	0.050	mg/L			02/24/12 19:10	1
Sulfate	550		20	20	mg/L			02/24/12 19:27	10
Chloride	220		10	10	mg/L			02/24/12 19:27	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 19:27	10
Ammonia	89		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:54	10
Specific Conductance	2000		1.0	1.0	umhos/cm			03/01/12 09:33	1

3/14/12
TC

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-SD-17-SW
Date Collected: 02/23/12 08:45
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39255-5
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	780	J	100	13	ug/L		02/24/12 09:45	02/27/12 13:12	1
Chromium	370	J	5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:12	1
Sodium	180000	J	2000	780	ug/L		02/24/12 09:45	03/06/12 16:00	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	890	J	100	13	ug/L			03/06/12 16:57	1
Chromium	410	J	5.0	0.66	ug/L			03/06/12 16:57	1
Sodium	210000	J	2000	780	ug/L			03/06/12 16:57	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	3.7		0.050	0.050	mg/L			02/24/12 19:44	1
Sulfate	460		20	20	mg/L			02/24/12 20:01	10
Chloride	210		10	10	mg/L			02/24/12 20:01	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 20:01	10
Ammonia	77		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:55	10
Specific Conductance	1800		1.0	1.0	umhos/cm			03/01/12 09:35	1

3/14/12
TC

Client Sample Results

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-PZ18R-SW
Date Collected: 02/23/12 08:55
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39255-6
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**82**	**J**	100	13	ug/L		02/24/12 09:45	02/27/12 13:15	1
Chromium	**14**		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:15	1
Sodium	**98000**	J	2000	780	ug/L		02/24/12 09:45	03/06/12 16:03	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**92**	**J**	100	13	ug/L			03/06/12 17:00	1
Chromium	**14**		5.0	0.66	ug/L			03/06/12 17:00	1
Sodium	**120000**	J	2000	780	ug/L			03/06/12 17:00	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	**0.34**		0.050	0.050	mg/L			02/24/12 20:19	1
Sulfate	**180**		20	20	mg/L			02/24/12 20:36	10
Chloride	**140**		10	10	mg/L			02/24/12 20:36	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 20:36	10
Ammonia	**51**		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:56	10
Specific Conductance	**1000**		1.0	1.0	umhos/cm			03/01/12 09:36	1

3/14/12
TC

Client Sample Results

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-ISCO1-SW
Date Collected: 02/23/12 09:05
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39255-7
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	85	J	100	13	ug/L		02/24/12 09:45	02/27/12 13:18	1
Chromium	15		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:18	1
Sodium	100000	J	2000	780	ug/L		02/24/12 09:45	03/06/12 16:06	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	100	J	100	13	ug/L			03/06/12 17:03	1
Chromium	15		5.0	0.66	ug/L			03/06/12 17:03	1
Sodium	120000	J	2000	780	ug/L			03/06/12 17:03	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.27		0.050	0.050	mg/L			02/24/12 20:53	1
Sulfate	170		20	20	mg/L			02/24/12 21:10	10
Chloride	140		10	10	mg/L			02/24/12 21:10	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 21:10	10
Ammonia	44		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:57	10
Specific Conductance	970		1.0	1.0	umhos/cm			03/01/12 09:45	1

3/14/12
TC

10.0 Application of Validation Qualifiers

Was any of the data qualified?

Yes [✓] **No** [ ] N/A [ ] Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag pages** for entry in database.

See Total VS. Dissolved comparison

REFERENCES

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U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.

MADEP, 2010. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Compendium of Quality Control Requirements and Performance Standards for Selected Analytical Protocols ," WSC-CAM #10-320, Final, Revision No. 1, 1 July 2010.

MADEP, 2010. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data in Support of Action Conducted Under the Massachusetts Contingency Plan (MCP)," WSC-CAM, Section VIIA, Final, Revision No. 1, 1 July 2010.

MADEP, 2010. "Quality Control Requirements and Performance Standards for the Analysis of Trace Metals by Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES) in Support of Response Actions under the Massachusetts Contingency Plan (MCP)" WSC-CAM, Final, Revision No. 1, 5 July 2010.

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Reviewer/Date Tige Cunningham 3-14-12
Sr. Review/Date
Lab Report # 360-39255-1 360-39262-1, 360-39434-1, 360-39540-1
Project # G107120016.01.10

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for **Sampling, Data Evaluation and Reporting Activities.**" MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? **Yes** [✓] No [ ] N/A [ ] Comments:
Check items received.

☑ *Name of Laboratory* ☑ *Address* ☑ *Project ID* ☑ *Phone #* ☑ *Sample identification – Field and Laboratory*

Client Information: ☑ *Name* ☑ *Address* ☑ *Client Contact* *(IDs must be cross-referenced)*

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement ***Yes*** [✓] *No* [ ] *N/A* [ ] *Comments:*

Does the laboratory report include a completed Analytical Report Certification in the required format?

***ACTION**: If no, contact lab for submission of missing certification or certification with correct format.*

1.3 Laboratory Case Narrative: ***Yes*** [✓] *No* [ ] *N/A* [ ] *Comments:*

☑ *Narrative serves as an exception report for the project and method QA/QC performance.* ☐ *Narrative includes an explanation of each discrepancy on the Certification Statement.*

***ACTION**: If no, contact lab for submission of missing or illegible information.*

1.4 Chain of Custody (COC) copy present with all documentation completed? **Yes** [✓] No [ ] N/A [ ] Comments:

Does the laboratory report include copies of Chain of Custody forms containing all samples in this SDG?

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of missing completed COC.

1.5 Sample Receipt Information (*Cooler Receipt Form*): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

Yes [✓] No [ ] N/A [ ] Comments:

☑ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).

☑ Container type noted ☑ Condition observed ☑ pH verified (where applicable) ☑ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were the correct bottles and preservatives used? Yes [✓] No [ ] N/A [ ] Comments:

Ammonia,– 1 Liter polyethylene/H_2SO_4 to pH<2,cool to 4°C

Oil & Grease – 1 Liter glass/HCL or H2SO4 to pH<2,cool to 4°C

Alkalinity – 1 Liter polyethylene/cool to 4°C

Chemical Oxygen Demand – 50 mL polyethylene/H_2SO_4 to pH<2,cool to 4°C

Chloride, pH, sulfate, nitrate, nitrite - 50 mL polyethylene/cool to 4°C

Nitrate/nitrite - H2SO4 to pH<2,cool to 4°C

Organic Carbon – 500 mL amber glass bottle/HCl or H_2SO_4 to pH<2,cool to 4°C

Sulfide – 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C

Phenolics - H_2SO_4 to pH<2,cool to 4°C

Specific conductance, TDS, TSS – 100 mL polyethylene/cool to 4°C

ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment

1.5.2 Were all samples delivered to the laboratory without breakage? Yes [✓] No [ ] N/A [ ] Comments:

1.5.3 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? Yes [ ] No [✓] N/A [ ] Comments:

1.6 Sample Results Section: *Was the following information supplied in the laboratory report for each sample?* **Yes** [✓] No [ ] N/A [ ] Comments:

☑ Field ID and Lab ID ☑ Date and time collected ☑ Analyst Initials ☑ Dilution Factor ☐ % moisture or solids (N/A) ☑ Reporting limits
☐ *Clean-up method* (N/A) ☑ Analysis method ☑ Preparation method ☑ Date of preparation/extraction/digestion clean-up and analysis, where applicable
☑ Matrix ☑ Target analytes and concentrations ☑ Units (soils must be reported in dry weight)

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was the following information provided in the laboratory report for each sample batch? **Yes** [✓] No [ ] N/A [ ] Comments:

☑ Method blank results ☑ LCS recoveries ☐ MS/MSD recoveries and RPDs (N/A) ☑ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times Yes [✓] **No** [ ] N/A [ ] Comments:

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? The holding times are as follows:

28 days = ammonia, chemical oxygen demand, chloride, organic carbon, oil & grease, specific conductance, total organic carbon and sulfate

Alkalinity = 14 days | Sulfide, TDS, TSS = 7 days | pH = analyze immediately | Nitrate nitrogen as N = 48 hrs

Nitrite nitrogen as N = 48 hrs | Nitrate + Nitrite as N = 28 days

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded qualify results (J). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. Professional judgment used to qualify soils.

3.0 Laboratory Method **Yes** [✓] No [ ] N/A [ ] Comments:

3.1 Was the correct laboratory method used?

ACTION: If no, contact lab to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change or to request variance.

3.2 Are the practical quantitation limits the same as those specified by the ☑ QAPP/IRSWP ☐ Lab? **Yes** [✓] No [ ] N/A [ ] Comments:

Note: *The MADEP QA/QC Guidelines do not yet list PQLs for wet chemistry analyses, therefore all criteria will default to values stipulated in the QAPP*. Where the QAPP does not define criteria, QA/QC requirements default to limits employed by the lab**. Other criteria may also apply.*

Ammonia* ☑ = 0.1 mg/ L	Alkalinity** ☐ = 1 mg/L	Bicarbonate Alkalinity** ☐ = 1 mg/L	Carbonate Alkalinity** ☐ = 1 mg/L
Nitrate Nitrogen as N* ☑ = .05 mg/L	Nitrite Nitrogen as N* ☑ = .01 mg/L	Chloride* ☑ = 1 mg/L	Hardness * ☐ = 2 mg/L
Spec. Cond.** ☑ 3 umhos/cm	Total Organic Carbon** ☐ = 1 mg/L	Oil & Grease* ☐ = 5.5 mg/L	Sulfate (EPA 300.0)* ☑ = 2 mg/L
COD:* Low – 20 mg/L	COD* High - 50 mg/L ☐	TDS* ☐ = 10 mg/L	TSS* ☑ = 5 mg/L
pH* ☐ < 2 to > 12	Phenolic - 0.01 mg/L		

Other parameter(list) _____ PQL = _____ ☐ Source of PQL = _____

Other parameter(list) _____ PQL = _____ ☐ Source of PQL = _____

ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are the appropriate parameter results present for each sample in the SDG? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If *dilutions were required, were dilution factors reported?* **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, contact the lab for submission.

4.0 <u>Method Blanks</u> **Yes** [✓] No [ ] N/A [ ] Comments:

4.1 Are the Method Blank Summaries present?

ACTION: If no, call the laboratory for submission of missing data.

4.2 Was a method blank analyzed for each analysis batch of wet chemistry field samples of 20 or less? **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.

4.3 Is the method blank less than the PQL? (See Section 3.2 for PQLs). **Yes [✓]** No [ ] N/A [ ] Comments:

4.4 Do any method blanks have positive results for wet chemistry parameters? Qualify data according to the following: Yes [ ] **No [✓]** N/A [ ] Comments:

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

ACTION: If any blank has positive results, list all the concentrations detected and flagging level (flagging level = 5 × blank value) on the checklist. List all affected samples and their qualifiers.

5.0 Laboratory Control Standards

5.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less? **Yes [✓]** No [ ] N/A [ ] Comments:

ACTION: If no, call laboratory for LCS form submittal. If data is not available, use professional judgment to determine qualification actions for data associated with the batch.

5.2 Is a LCS Summary Form present? **Yes [✓]** No [ ] N/A [ ] Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is any wet chemistry analyte LCS recovery outside the control limits? Yes [ ] **No [✓]** N/A [ ] Comments:

LCS Limits:

Alkalinity** ☐ = 80-120%	Bicarbonate Alkalinity** ☐ = 80-120%	Carbonate Alkalinity** ☐ = 80-120%	Specific Conductivity *☑ = 80-120%
Total Organic Carbon** ☐ = 80-120%	TDS** ☐ = 80-120%	Oil & Grease* ☐ = 80-120%	Ammonia Nitrogen as N* ☑ = 80-120%
COD Low* ☐ = 80-120%	COD High* ☐ = 80-120%	Nitrate Nitrogen as N**☑ = 80-120%	Nitrite Nitrogen as N** ☑ = 80-120%
Hardness* ☐ = 80-120%	Chloride* ☑ = 80-120%	Sulfate (EPA 300.0)* ☑ = 80-120%	pH* ☐ = 98-102% TSS* NA

Other parameter(list) _____ %R = _____ ☐ Rec Limits= _____

Other parameter(list) _____ %R = _____ ☐ Rec Limits = _____

(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs analyzed? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the MS/MSD Recovery Form present?

ACTION: If no, contact lab for resubmission of missing data.

6.3 Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix?

ACTION: If any matrix spike data is missing, call lab for resubmission.

Yes [✓]	No [ ] (TC)	N/A [ ]	Comments: For 360-39202-1 only (GW) Sulfate/ Chloride only
Yes [✓]	No [ ]	N/A [ ] (TC)	Comments:
Yes [✓]	No [ ]	N/A [ ] (TC)	Comments:
Yes [ ]	**No** [✓]	N/A [ ]	Comments:

6.4 Are any wet chemistry analyte spike recoveries outside of the QC limits?

NOTE: $\%R = \frac{(SSR-SR)}{SA} \times 100\%$ Where: SSR = Spiked sample result
SR = Sample result
SA = Spike added

MS/MSD Recovery Limits:

Alkalinity* = NA	Bicarbonate Alkalinity* = NA	Carbonate alkalinity* = NA	Ammonia* (LACHAT) ☐ = 75-125%
Chloride*(SM 4500 Cl) ☐= 75-125%	Specific Conductivity * = NA	Total Organic Carbon* = NA	TDS** = NA
Oil & Grease* = NA	COD Low* ☐ = 75-125%	COD High* ☐ = 75-125%	Nitrate Nitrogen as N** ☐ = 75-125%
Nitrite Nitrogen as N** ☐ = 75-125%	Hardness* ☐ = 75-125%	Chloride/Sulfate (EPA 300.0)* ☑ = 75-125%	pH* = NA TSS* = NA

Other parameter(list) _____ % R = _____ ☐ Rec Limits = _____

* = Laboratory Limits ** = Olin QAPP Limits (*MADEP has not yet defined LCS recovery limits for wet chemistry analyses.*)

NOTES: 1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.
2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: MS/MSD flags only apply to the sample spiked. Do not evaluate if sample concentration is > 4X spike. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit but > 30%, qualify both positive results and non-detects (J). If the MS/MSD recovery is < 30% and the sample is non-detect, the results are considered unusable and flagged (R).

ACTION: Laboratory control limits apply when spiked sample results fall within the normal calibration range. If dilutions are required due to high sample concentrations, the data is evaluated, but no flags are applied.

6.5 Are any RPDs for MS/MSD recoveries outside of the QA/QC limits?

NOTE: $RPD = \frac{S - D}{(S + D)/2} \times 100\%$ Where S = MS result
D = MSD result

Yes [✓] **No** [ ] N/A [ ] Comments: TC

	MS	MSD	RPD
Sulfate	137%	80%	20
Chloride	126%	94%	21

MS/MSD RPD Limits:

RPD ≤ 20

7.0 Laboratory Duplicate

Are the RPDs for the laboratory duplicates <20% unless otherwise specified below?

Yes [ ] No [ ] N/A [✓] Comments: only for Specific conductivity

Method: 300.0 - Chloride & Sulfate (Continued)

Lab Sample ID: LCS 360-87944/6
Matrix: Water
Analysis Batch: 87944

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	40.0	40.5		mg/L		101	85 - 115

Lab Sample ID: MB 360-87947/3
Matrix: Water
Analysis Batch: 87947

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0	2.0	mg/L			02/28/12 16:59	1
Chloride	ND		1.0	1.0	mg/L			02/28/12 16:59	1

Lab Sample ID: LCS 360-87947/4
Matrix: Water
Analysis Batch: 87947

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	80.0	81.6		mg/L		102	85 - 115
Chloride	40.0	40.8		mg/L		102	85 - 115

Lab Sample ID: MB 360-88087/3
Matrix: Water
Analysis Batch: 88087

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0	2.0	mg/L			03/02/12 11:06	1
Chloride	ND		1.0	1.0	mg/L			03/02/12 11:06	1

Lab Sample ID: LCS 360-88087/4
Matrix: Water
Analysis Batch: 88087

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	80.0	81.4		mg/L		102	85 - 115
Chloride	40.0	40.7		mg/L		102	85 - 115

Lab Sample ID: 360-39262-2 MS
Matrix: Water
Analysis Batch: 88087

Client Sample ID: OC-GW-202S
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	360		200	633	F	mg/L		137	75 - 125
Chloride	45		100	171	F	mg/L		126	75 - 125

Lab Sample ID: 360-39262-2 MSD
Matrix: Water
Analysis Batch: 88087

Client Sample ID: OC-GW-202S
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	360		200	518		mg/L		80	75 - 125	20	20
Chloride	45		100	139	F	mg/L		94	75 - 125	21	20

TC

ACTION: If the RPD is greater than specified limits, qualify all results for that analyte as estimated (J).

pH* ☐ = 3% Specific Conductivity *☑ = 5% TSS** ☐ = 6% TDS** ☐ = 6%

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist. **Yes** [ ] No [✓] N/A [ ] Comments:

8.2 Do any rinsate blanks have positive results? Yes [ ] **No** [ ] N/A [✓] Comments:

ACTION: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below.

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

NOTE: *MADEP does not require the collection of rinsate blanks.*

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates. **Yes** [✓] No [ ] N/A [ ] Comments:

9.2 Were field duplicates collected per the required frequency? **Yes** [✓] No [ ] N/A [ ] Comments:

QAPP/IRSWP ☑ *MADEP Option 1(1 per 20)* ☐ *MADEP Option 3 (1 per 10)* ☐

9.3 Was the RPD ≤ 30% for waters ≤ 50% for soils? Calculate the RPD for results and attach to this review. **Yes** [✓] No [ ] N/A [ ] Comments:

ACTION:. Qualify data (J) for both sample results if the RPD exceeded.

Was any of the data qualified? Yes [✓] **No** [ ] N/A [ ] Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag pages** for entry in database.

Chloride & Sulfate Results in 225 & 225D UP Qualified estimated (J) from ms/msd out ↑

REFERENCES:-

MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts.; Project No. 6300-06-0010/41.1; July 25, 2007.

MADEP, 2010. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Compendium of Quality Control Requirements and Performance Standards for Selected Analytical Protocols ," WSC-CAM #10-320, Final, Revision No. 1, 5 July 2010.

MADEP, 2010. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data in Support of Action Conducted Under the Massachusetts Contingency Plan (MCP)," WSC-CAM, Section VIIA, Final, Revision No. 1, 1 July 2010.

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Client Sample ID: OC-GW-202S
Date Collected: 02/22/12 08:30
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39262-2
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/06/12 16:19	1
Chromium	**3.3**	**J**	5.0	0.66	ug/L			03/06/12 16:19	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**360**	J	20	20	mg/L			03/02/12 12:15	10
Chloride	**47**	J	1.0	1.0	mg/L			03/02/12 11:58	1
Ammonia	**73**		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:59	10
Specific Conductance	**1100**		1.0	1.0	umhos/cm			03/01/12 09:42	1

TC
3/15/12

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Client Sample ID: OC-GW-202SDUP
Date Collected: 02/22/12 08:30
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39262-3
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/06/12 16:30	1
Chromium	**3.4**	**J**	5.0	0.66	ug/L			03/06/12 16:30	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**350**	J+	20	20	mg/L			02/28/12 03:19	10
Chloride	**46**		1.0	1.0	mg/L			02/28/12 03:02	1
Ammonia	**66**		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 16:04	10
Specific Conductance	**1100**		1.0	1.0	umhos/cm			03/01/12 09:48	1

TC
3/15/12

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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Westfield
Westfield Executive Park
53 Southampton Road
Westfield, MA 01085
Tel: (413)572-4000

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY:

TestAmerica Job ID: 360-39255-1
Client Project/Site: Olin Chemical Surface water Quarterly

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
3/8/2012 9:58:08 AM
Joe Chimi
Report Production Representative
joe.chimi@testamericainc.com

Designee for

Becky Mason
Project Manager II
becky.mason@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Job ID: 360-39255-1

Laboratory: TestAmerica Westfield

Narrative

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 02/23/2012; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 6.0 C.

METALS (ICP)
Samples OC-ISCO3-SW (360-39255-1), OC-ISCO2-SW (360-39255-2), OC-SW-PZ16RR-SW (360-39255-3), OC-SW-PZ-17RR-SW (360-39255-4), OC-SD-17-SW (360-39255-5), OC-PZ18R-SW (360-39255-6) and OC-ISCO1-SW (360-39255-7) were analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 02/24/2012 and analyzed on 02/27/2012 and 03/06/2012.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No difficulties were encountered during the metals analyses.

All quality control parameters were within the acceptance limits.

DISSOLVED METALS (ICP)
Samples OC-ISCO3-SW (360-39255-1), OC-ISCO2-SW (360-39255-2), OC-SW-PZ16RR-SW (360-39255-3), OC-SW-PZ-17RR-SW (360-39255-4), OC-SD-17-SW (360-39255-5), OC-PZ18R-SW (360-39255-6) and OC-ISCO1-SW (360-39255-7) were analyzed for dissolved metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were analyzed on 03/06/2012.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No difficulties were encountered during the metals (ICP) analyses.

All quality control parameters were within the acceptance limits.

ANIONS (28 DAY HOLD TIME)
Samples OC-ISCO3-SW (360-39255-1), OC-ISCO2-SW (360-39255-2), OC-SW-PZ16RR-SW (360-39255-3), OC-SW-PZ-17RR-SW (360-39255-4), OC-SD-17-SW (360-39255-5), OC-PZ18R-SW (360-39255-6) and OC-ISCO1-SW (360-39255-7) were analyzed for anions (28 day hold time) in accordance with EPA Method 300.0. The samples were analyzed on 02/24/2012.

Samples OC-ISCO3-SW (360-39255-1)[10X], OC-ISCO2-SW (360-39255-2)[10X], OC-SW-PZ16RR-SW (360-39255-3)[10X], OC-SW-PZ-17RR-SW (360-39255-4)[10X], OC-SD-17-SW (360-39255-5)[10X], OC-PZ18R-SW (360-39255-6)[10X] and OC-ISCO1-SW (360-39255-7)[10X] required dilution prior to analysis due to high target concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the anions analyses.

All quality control parameters were within the acceptance limits.

ANIONS (48 HR HOLD TIME)
Samples OC-ISCO3-SW (360-39255-1), OC-ISCO2-SW (360-39255-2), OC-SW-PZ16RR-SW (360-39255-3), OC-SW-PZ-17RR-SW

Job ID: 360-39255-1 (Continued)

Laboratory: TestAmerica Westfield (Continued)

(360-39255-4), OC-SD-17-SW (360-39255-5), OC-PZ18R-SW (360-39255-6) and OC-ISCO1-SW (360-39255-7) were analyzed for anions (48 hr hold time) in accordance with EPA Method 300.0. The samples were analyzed on 02/24/2012.

Samples OC-ISCO3-SW (360-39255-1)[10X], OC-ISCO2-SW (360-39255-2)[10X], OC-SW-PZ16RR-SW (360-39255-3)[10X], OC-SW-PZ-17RR-SW (360-39255-4)[10X], OC-SD-17-SW (360-39255-5)[10X], OC-PZ18R-SW (360-39255-6)[10X] and OC-ISCO1-SW (360-39255-7)[10X] required dilution prior to analysis due to high non-target concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the anions analyses.

All quality control parameters were within the acceptance limits.

AMMONIA

Samples OC-ISCO3-SW (360-39255-1), OC-ISCO2-SW (360-39255-2), OC-SW-PZ16RR-SW (360-39255-3), OC-SW-PZ-17RR-SW (360-39255-4), OC-SD-17-SW (360-39255-5), OC-PZ18R-SW (360-39255-6) and OC-ISCO1-SW (360-39255-7) were analyzed for ammonia in accordance with Lachat 107-06-1B. The samples were prepared and analyzed on 02/27/2012.

Samples OC-ISCO2-SW (360-39255-2)[10X], OC-SW-PZ16RR-SW (360-39255-3)[10X], OC-SW-PZ-17RR-SW (360-39255-4)[10X], OC-SD-17-SW (360-39255-5)[10X], OC-PZ18R-SW (360-39255-6)[10X] and OC-ISCO1-SW (360-39255-7)[10X] required dilution prior to analysis due to high concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the ammonia analyses.

All quality control parameters were within the acceptance limits.

SPECIFIC CONDUCTIVITY

Samples OC-ISCO3-SW (360-39255-1), OC-ISCO2-SW (360-39255-2), OC-SW-PZ16RR-SW (360-39255-3), OC-SW-PZ-17RR-SW (360-39255-4), OC-SD-17-SW (360-39255-5), OC-PZ18R-SW (360-39255-6) and OC-ISCO1-SW (360-39255-7) were analyzed for specific conductivity in accordance with SM20 2510B. The samples were analyzed on 03/01/2012.

No difficulties were encountered during the conductivity analyses.

All quality control parameters were within the acceptance limits.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Westfield** Project #: **360-39255-1**

Project Location: **Wilmington, MA** RTN:

This form provides certifications for the following data set: list Laboratory Sample ID Number(s):

360-39255-(1-7)

Matrices: [X] Groundwater/Surface Water [ ] Soil/Sediment [ ] Drinking Water [ ] Air [ ] Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A [ ]	7470/7471 Hg CAM III B [ ]	Mass DEP VPH CAM IV A [ ]	8081 Pesticides CAM V B [ ]	7196 Hex Cr CAM VI B [ ]	Mass DEP APH CAM IX A [ ]
8270 SVOC CAM II B [ ]	7010 Metals CAM III C [ ]	Mass DEP EPH CAM IV B [ ]	8151 Herbicides CAM V C [ ]	8330 Explosives CAM VIII A [ ]	TO-15 VOC CAM IX B [ ]
6010 Metals CAM III A [X]	6020 Metals CAM III D [ ]	8082 PCB CAM V A [ ]	9014 Total Cyanide/PAC CAM VI A [ ]	6860 Perchlorate CAM VIII B [ ]	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	[X] Yes [ ] No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	[X] Yes [ ] No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	[X] Yes [ ] No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	[X] Yes [ ] No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	[ ] Yes [ ] No [ ] Yes [ ] No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	[X] Yes [ ] No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

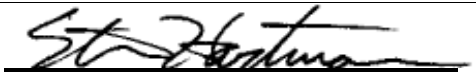
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	[X] Yes [ ] No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	[X] Yes [ ] No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	[ ] Yes [X] No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature:  Position: Laboratory Director

Printed Name: Steven C. Hartmann Date: 3/8/12 9:52

This form has been electronically signed and approved

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-ISCO3-SW — Lab Sample ID: 360-39255-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	39	J	100	13	ug/L	1		6010C	Total/NA
Chromium	0.68	J	5.0	0.66	ug/L	1		6010C	Total/NA
Sodium	77000		2000	780	ug/L	1		6010C	Total/NA
Aluminum	36	J	100	13	ug/L	1		6010C	Dissolved
Sodium	88000		2000	780	ug/L	1		6010C	Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	0.94		0.050	0.050	mg/L	1		300.0	Total/NA
Sulfate	36		2.0	2.0	mg/L	1		300.0	Total/NA
Chloride	140		10	10	mg/L	10		300.0	Total/NA
Ammonia	2.4		0.10	0.10	mg/L	1		L107-06-1B	Total/NA
Specific Conductance	670		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-ISCO2-SW — Lab Sample ID: 360-39255-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	140		100	13	ug/L	1		6010C	Total/NA
Chromium	73		5.0	0.66	ug/L	1		6010C	Total/NA
Sodium	140000		2000	780	ug/L	1		6010C	Total/NA
Aluminum	150		100	13	ug/L	1		6010C	Dissolved
Chromium	74		5.0	0.66	ug/L	1		6010C	Dissolved
Sodium	150000		2000	780	ug/L	1		6010C	Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	1.2		0.050	0.050	mg/L	1		300.0	Total/NA
Sulfate	420		20	20	mg/L	10		300.0	Total/NA
Chloride	130		10	10	mg/L	10		300.0	Total/NA
Ammonia	92		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1500		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-SW-PZ16RR-SW — Lab Sample ID: 360-39255-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	640		100	13	ug/L	1		6010C	Total/NA
Chromium	340		5.0	0.66	ug/L	1		6010C	Total/NA
Sodium	150000		2000	780	ug/L	1		6010C	Total/NA
Aluminum	760		100	13	ug/L	1		6010C	Dissolved
Chromium	360		5.0	0.66	ug/L	1		6010C	Dissolved
Sodium	170000		2000	780	ug/L	1		6010C	Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	1.1		0.050	0.050	mg/L	1		300.0	Total/NA
Sulfate	470		20	20	mg/L	10		300.0	Total/NA
Chloride	160		10	10	mg/L	10		300.0	Total/NA
Ammonia	100		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1600		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-SW-PZ-17RR-SW — Lab Sample ID: 360-39255-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	1000		100	13	ug/L	1		6010C	Total/NA
Chromium	510		5.0	0.66	ug/L	1		6010C	Total/NA
Sodium	190000		2000	780	ug/L	1		6010C	Total/NA
Aluminum	1200		100	13	ug/L	1		6010C	Dissolved
Chromium	540		5.0	0.66	ug/L	1		6010C	Dissolved
Sodium	220000		2000	780	ug/L	1		6010C	Dissolved

Client Sample ID: OC-SW-PZ-17RR-SW (Continued) — Lab Sample ID: 360-39255-4

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	3.4		0.050	0.050	mg/L	1		300.0	Total/NA
Sulfate	550		20	20	mg/L	10		300.0	Total/NA
Chloride	220		10	10	mg/L	10		300.0	Total/NA
Ammonia	89		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	2000		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-SD-17-SW — Lab Sample ID: 360-39255-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	780		100	13	ug/L	1		6010C	Total/NA
Chromium	370		5.0	0.66	ug/L	1		6010C	Total/NA
Sodium	180000		2000	780	ug/L	1		6010C	Total/NA
Aluminum	890		100	13	ug/L	1		6010C	Dissolved
Chromium	410		5.0	0.66	ug/L	1		6010C	Dissolved
Sodium	210000		2000	780	ug/L	1		6010C	Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	3.7		0.050	0.050	mg/L	1		300.0	Total/NA
Sulfate	460		20	20	mg/L	10		300.0	Total/NA
Chloride	210		10	10	mg/L	10		300.0	Total/NA
Ammonia	77		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1800		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ18R-SW — Lab Sample ID: 360-39255-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	82	J	100	13	ug/L	1		6010C	Total/NA
Chromium	14		5.0	0.66	ug/L	1		6010C	Total/NA
Sodium	98000		2000	780	ug/L	1		6010C	Total/NA
Aluminum	92	J	100	13	ug/L	1		6010C	Dissolved
Chromium	14		5.0	0.66	ug/L	1		6010C	Dissolved
Sodium	120000		2000	780	ug/L	1		6010C	Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	0.34		0.050	0.050	mg/L	1		300.0	Total/NA
Sulfate	180		20	20	mg/L	10		300.0	Total/NA
Chloride	140		10	10	mg/L	10		300.0	Total/NA
Ammonia	51		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1000		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-ISCO1-SW — Lab Sample ID: 360-39255-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	85	J	100	13	ug/L	1		6010C	Total/NA
Chromium	15		5.0	0.66	ug/L	1		6010C	Total/NA
Sodium	100000		2000	780	ug/L	1		6010C	Total/NA
Aluminum	100		100	13	ug/L	1		6010C	Dissolved
Chromium	15		5.0	0.66	ug/L	1		6010C	Dissolved
Sodium	120000		2000	780	ug/L	1		6010C	Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	0.27		0.050	0.050	mg/L	1		300.0	Total/NA
Sulfate	170		20	20	mg/L	10		300.0	Total/NA
Chloride	140		10	10	mg/L	10		300.0	Total/NA
Ammonia	44		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	970		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Method Summary

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL WFD
300.0	Chloride & Sulfate	40CFR136A	TAL WFD
300.0	Nitrate & Nitrite	40CFR136A	TAL WFD
L107-06-1B	Nitrogen Ammonia	LACHAT	TAL WFD
SM 2510B	Conductivity, Specific Conductance	SM	TAL WFD

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater ", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

Sample Summary

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
360-39255-1	OC-ISCO3-SW	Water	02/23/12 07:20	02/23/12 16:45
360-39255-2	OC-ISCO2-SW	Water	02/23/12 07:40	02/23/12 16:45
360-39255-3	OC-SW-PZ16RR-SW	Water	02/23/12 08:00	02/23/12 16:45
360-39255-4	OC-SW-PZ-17RR-SW	Water	02/23/12 08:20	02/23/12 16:45
360-39255-5	OC-SD-17-SW	Water	02/23/12 08:45	02/23/12 16:45
360-39255-6	OC-PZ18R-SW	Water	02/23/12 08:55	02/23/12 16:45
360-39255-7	OC-ISCO1-SW	Water	02/23/12 09:05	02/23/12 16:45

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-ISCO3-SW
Date Collected: 02/23/12 07:20
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39255-1
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**39**	**J**	100	13	ug/L		02/24/12 09:45	02/27/12 12:54	1
Chromium	**0.68**	**J**	5.0	0.66	ug/L		02/24/12 09:45	02/27/12 12:54	1
Sodium	**77000**		2000	780	ug/L		02/24/12 09:45	03/06/12 15:47	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**36**	**J**	100	13	ug/L			03/06/12 16:39	1
Chromium	ND		5.0	0.66	ug/L			03/06/12 16:39	1
Sodium	**88000**		2000	780	ug/L			03/06/12 16:39	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	**0.94**		0.050	0.050	mg/L			02/24/12 16:53	1
Sulfate	**36**		2.0	2.0	mg/L			02/24/12 16:53	1
Chloride	**140**		10	10	mg/L			02/24/12 17:10	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 17:10	10
Ammonia	**2.4**		0.10	0.10	mg/L		02/27/12 10:48	02/27/12 15:34	1
Specific Conductance	**670**		1.0	1.0	umhos/cm			03/01/12 09:29	1

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-ISCO2-SW
Date Collected: 02/23/12 07:40
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39255-2
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	140		100	13	ug/L		02/24/12 09:45	02/27/12 12:57	1
Chromium	73		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 12:57	1
Sodium	140000		2000	780	ug/L		02/24/12 09:45	03/06/12 15:51	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	150		100	13	ug/L			03/06/12 16:42	1
Chromium	74		5.0	0.66	ug/L			03/06/12 16:42	1
Sodium	150000		2000	780	ug/L			03/06/12 16:42	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	1.2		0.050	0.050	mg/L			02/24/12 17:27	1
Sulfate	420		20	20	mg/L			02/24/12 17:45	10
Chloride	130		10	10	mg/L			02/24/12 17:45	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 17:45	10
Ammonia	92		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:52	10
Specific Conductance	1500		1.0	1.0	umhos/cm			03/01/12 09:30	1

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-SW-PZ16RR-SW
Date Collected: 02/23/12 08:00
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39255-3
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	640		100	13	ug/L		02/24/12 09:45	02/27/12 13:00	1
Chromium	340		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:00	1
Sodium	150000		2000	780	ug/L		02/24/12 09:45	03/06/12 15:54	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	760		100	13	ug/L			03/06/12 16:51	1
Chromium	360		5.0	0.66	ug/L			03/06/12 16:51	1
Sodium	170000		2000	780	ug/L			03/06/12 16:51	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	1.1		0.050	0.050	mg/L			02/24/12 18:02	1
Sulfate	470		20	20	mg/L			02/24/12 18:53	10
Chloride	160		10	10	mg/L			02/24/12 18:53	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 18:53	10
Ammonia	100		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:53	10
Specific Conductance	1600		1.0	1.0	umhos/cm			03/01/12 09:32	1

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-SW-PZ-17RR-SW
Date Collected: 02/23/12 08:20
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39255-4
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	1000		100	13	ug/L		02/24/12 09:45	02/27/12 13:09	1
Chromium	510		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:09	1
Sodium	190000		2000	780	ug/L		02/24/12 09:45	03/06/12 15:57	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	1200		100	13	ug/L			03/06/12 16:54	1
Chromium	540		5.0	0.66	ug/L			03/06/12 16:54	1
Sodium	220000		2000	780	ug/L			03/06/12 16:54	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	3.4		0.050	0.050	mg/L			02/24/12 19:10	1
Sulfate	550		20	20	mg/L			02/24/12 19:27	10
Chloride	220		10	10	mg/L			02/24/12 19:27	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 19:27	10
Ammonia	89		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:54	10
Specific Conductance	2000		1.0	1.0	umhos/cm			03/01/12 09:33	1

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-SD-17-SW
Date Collected: 02/23/12 08:45
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39255-5
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	780		100	13	ug/L		02/24/12 09:45	02/27/12 13:12	1
Chromium	370		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:12	1
Sodium	180000		2000	780	ug/L		02/24/12 09:45	03/06/12 16:00	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	890		100	13	ug/L			03/06/12 16:57	1
Chromium	410		5.0	0.66	ug/L			03/06/12 16:57	1
Sodium	210000		2000	780	ug/L			03/06/12 16:57	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	3.7		0.050	0.050	mg/L			02/24/12 19:44	1
Sulfate	460		20	20	mg/L			02/24/12 20:01	10
Chloride	210		10	10	mg/L			02/24/12 20:01	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 20:01	10
Ammonia	77		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:55	10
Specific Conductance	1800		1.0	1.0	umhos/cm			03/01/12 09:35	1

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-PZ18R-SW
Date Collected: 02/23/12 08:55
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39255-6
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	82	J	100	13	ug/L		02/24/12 09:45	02/27/12 13:15	1
Chromium	14		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:15	1
Sodium	98000		2000	780	ug/L		02/24/12 09:45	03/06/12 16:03	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	92	J	100	13	ug/L			03/06/12 17:00	1
Chromium	14		5.0	0.66	ug/L			03/06/12 17:00	1
Sodium	120000		2000	780	ug/L			03/06/12 17:00	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.34		0.050	0.050	mg/L			02/24/12 20:19	1
Sulfate	180		20	20	mg/L			02/24/12 20:36	10
Chloride	140		10	10	mg/L			02/24/12 20:36	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 20:36	10
Ammonia	51		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:56	10
Specific Conductance	1000		1.0	1.0	umhos/cm			03/01/12 09:36	1

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-ISCO1-SW
Date Collected: 02/23/12 09:05
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39255-7
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	85	J	100	13	ug/L		02/24/12 09:45	02/27/12 13:18	1
Chromium	15		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 13:18	1
Sodium	100000		2000	780	ug/L		02/24/12 09:45	03/06/12 16:06	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	100		100	13	ug/L			03/06/12 17:03	1
Chromium	15		5.0	0.66	ug/L			03/06/12 17:03	1
Sodium	120000		2000	780	ug/L			03/06/12 17:03	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.27		0.050	0.050	mg/L			02/24/12 20:53	1
Sulfate	170		20	20	mg/L			02/24/12 21:10	10
Chloride	140		10	10	mg/L			02/24/12 21:10	10
Nitrite as N	ND		0.10	0.10	mg/L			02/24/12 21:10	10
Ammonia	44		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:57	10
Specific Conductance	970		1.0	1.0	umhos/cm			03/01/12 09:45	1

Definitions/Glossary

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Metals

Prep Batch: 87766

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Total/NA	Water	3010A	
360-39255-2	OC-ISCO2-SW	Total/NA	Water	3010A	
360-39255-3	OC-SW-PZ16RR-SW	Total/NA	Water	3010A	
360-39255-4	OC-SW-PZ-17RR-SW	Total/NA	Water	3010A	
360-39255-5	OC-SD-17-SW	Total/NA	Water	3010A	
360-39255-6	OC-PZ18R-SW	Total/NA	Water	3010A	
360-39255-7	OC-ISCO1-SW	Total/NA	Water	3010A	
LCS 360-87766/2-A	Lab Control Sample	Total/NA	Water	3010A	
LCSD 360-87766/3-A	Lab Control Sample Dup	Total/NA	Water	3010A	
MB 360-87766/1-A	Method Blank	Total/NA	Water	3010A	

Analysis Batch: 87865

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Total/NA	Water	6010C	87766
360-39255-2	OC-ISCO2-SW	Total/NA	Water	6010C	87766
360-39255-3	OC-SW-PZ16RR-SW	Total/NA	Water	6010C	87766
360-39255-4	OC-SW-PZ-17RR-SW	Total/NA	Water	6010C	87766
360-39255-5	OC-SD-17-SW	Total/NA	Water	6010C	87766
360-39255-6	OC-PZ18R-SW	Total/NA	Water	6010C	87766
360-39255-7	OC-ISCO1-SW	Total/NA	Water	6010C	87766
LCS 360-87766/2-A	Lab Control Sample	Total/NA	Water	6010C	87766
LCSD 360-87766/3-A	Lab Control Sample Dup	Total/NA	Water	6010C	87766
MB 360-87766/1-A	Method Blank	Total/NA	Water	6010C	87766

Analysis Batch: 88128

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Total/NA	Water	6010C	87766
360-39255-2	OC-ISCO2-SW	Total/NA	Water	6010C	87766
360-39255-3	OC-SW-PZ16RR-SW	Total/NA	Water	6010C	87766
360-39255-4	OC-SW-PZ-17RR-SW	Total/NA	Water	6010C	87766
360-39255-5	OC-SD-17-SW	Total/NA	Water	6010C	87766
360-39255-6	OC-PZ18R-SW	Total/NA	Water	6010C	87766
360-39255-7	OC-ISCO1-SW	Total/NA	Water	6010C	87766

Analysis Batch: 88130

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Dissolved	Water	6010C	
360-39255-2	OC-ISCO2-SW	Dissolved	Water	6010C	
360-39255-3	OC-SW-PZ16RR-SW	Dissolved	Water	6010C	
360-39255-4	OC-SW-PZ-17RR-SW	Dissolved	Water	6010C	
360-39255-5	OC-SD-17-SW	Dissolved	Water	6010C	
360-39255-6	OC-PZ18R-SW	Dissolved	Water	6010C	
360-39255-7	OC-ISCO1-SW	Dissolved	Water	6010C	
LCS 360-88130/1	Lab Control Sample	Total/NA	Water	6010C	
LCSD 360-88130/13	Lab Control Sample Dup	Total/NA	Water	6010C	
MB 360-88130/2	Method Blank	Total/NA	Water	6010C	

General Chemistry

Analysis Batch: 87810

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Total/NA	Water	300.0	

General Chemistry (Continued)

Analysis Batch: 87810 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Total/NA	Water	300.0	
360-39255-2	OC-ISCO2-SW	Total/NA	Water	300.0	
360-39255-3	OC-SW-PZ16RR-SW	Total/NA	Water	300.0	
360-39255-4	OC-SW-PZ-17RR-SW	Total/NA	Water	300.0	
360-39255-5	OC-SD-17-SW	Total/NA	Water	300.0	
360-39255-6	OC-PZ18R-SW	Total/NA	Water	300.0	
360-39255-7	OC-ISCO1-SW	Total/NA	Water	300.0	
LCS 360-87810/4	Lab Control Sample	Total/NA	Water	300.0	
MB 360-87810/3	Method Blank	Total/NA	Water	300.0	

Prep Batch: 87823

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Total/NA	Water	Distill/Ammonia	
360-39255-2	OC-ISCO2-SW	Total/NA	Water	Distill/Ammonia	
360-39255-3	OC-SW-PZ16RR-SW	Total/NA	Water	Distill/Ammonia	
360-39255-4	OC-SW-PZ-17RR-SW	Total/NA	Water	Distill/Ammonia	
360-39255-5	OC-SD-17-SW	Total/NA	Water	Distill/Ammonia	
360-39255-6	OC-PZ18R-SW	Total/NA	Water	Distill/Ammonia	
360-39255-7	OC-ISCO1-SW	Total/NA	Water	Distill/Ammonia	
LCS 360-87823/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 360-87823/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 87850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Total/NA	Water	L107-06-1B	87823
360-39255-2	OC-ISCO2-SW	Total/NA	Water	L107-06-1B	87823
360-39255-3	OC-SW-PZ16RR-SW	Total/NA	Water	L107-06-1B	87823
360-39255-4	OC-SW-PZ-17RR-SW	Total/NA	Water	L107-06-1B	87823
360-39255-5	OC-SD-17-SW	Total/NA	Water	L107-06-1B	87823
360-39255-6	OC-PZ18R-SW	Total/NA	Water	L107-06-1B	87823
360-39255-7	OC-ISCO1-SW	Total/NA	Water	L107-06-1B	87823
LCS 360-87823/2-A	Lab Control Sample	Total/NA	Water	L107-06-1B	87823
MB 360-87823/1-A	Method Blank	Total/NA	Water	L107-06-1B	87823

Analysis Batch: 87884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Total/NA	Water	300.0	
360-39255-1	OC-ISCO3-SW	Total/NA	Water	300.0	
360-39255-2	OC-ISCO2-SW	Total/NA	Water	300.0	
360-39255-2	OC-ISCO2-SW	Total/NA	Water	300.0	
360-39255-3	OC-SW-PZ16RR-SW	Total/NA	Water	300.0	
360-39255-3	OC-SW-PZ16RR-SW	Total/NA	Water	300.0	
360-39255-4	OC-SW-PZ-17RR-SW	Total/NA	Water	300.0	
360-39255-4	OC-SW-PZ-17RR-SW	Total/NA	Water	300.0	
360-39255-5	OC-SD-17-SW	Total/NA	Water	300.0	
360-39255-5	OC-SD-17-SW	Total/NA	Water	300.0	
360-39255-6	OC-PZ18R-SW	Total/NA	Water	300.0	
360-39255-6	OC-PZ18R-SW	Total/NA	Water	300.0	
360-39255-7	OC-ISCO1-SW	Total/NA	Water	300.0	
360-39255-7	OC-ISCO1-SW	Total/NA	Water	300.0	
LCS 360-87884/4	Lab Control Sample	Total/NA	Water	300.0	
MB 360-87884/3	Method Blank	Total/NA	Water	300.0	

General Chemistry (Continued)

Analysis Batch: 87959

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39255-1	OC-ISCO3-SW	Total/NA	Water	SM 2510B	
360-39255-2	OC-ISCO2-SW	Total/NA	Water	SM 2510B	
360-39255-3	OC-SW-PZ16RR-SW	Total/NA	Water	SM 2510B	
360-39255-4	OC-SW-PZ-17RR-SW	Total/NA	Water	SM 2510B	
360-39255-5	OC-SD-17-SW	Total/NA	Water	SM 2510B	
360-39255-6	OC-PZ18R-SW	Total/NA	Water	SM 2510B	
360-39255-7	OC-ISCO1-SW	Total/NA	Water	SM 2510B	
LCS 360-87959/1	Lab Control Sample	Total/NA	Water	SM 2510B	
MB 360-87959/3	Method Blank	Total/NA	Water	SM 2510B	

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 360-87766/1-A
Matrix: Water
Analysis Batch: 87865

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 87766

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L		02/24/12 09:45	02/27/12 12:02	1
Chromium	ND		5.0	0.66	ug/L		02/24/12 09:45	02/27/12 12:02	1
Sodium	ND		2000	780	ug/L		02/24/12 09:45	02/27/12 12:02	1

Lab Sample ID: LCS 360-87766/2-A
Matrix: Water
Analysis Batch: 87865

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 87766

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	5000	5010		ug/L		100	80 - 120
Chromium	1000	1020		ug/L		102	80 - 120
Sodium	20000	20700		ug/L		103	80 - 120

Lab Sample ID: LCSD 360-87766/3-A
Matrix: Water
Analysis Batch: 87865

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 87766

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	5000	5260		ug/L		105	80 - 120	5	20
Chromium	1000	1050		ug/L		105	80 - 120	3	20
Sodium	20000	20600		ug/L		103	80 - 120	0	20

Lab Sample ID: MB 360-88130/2
Matrix: Water
Analysis Batch: 88130

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/06/12 16:13	1
Chromium	ND		5.0	0.66	ug/L			03/06/12 16:13	1
Sodium	ND		2000	780	ug/L			03/06/12 16:13	1

Lab Sample ID: LCS 360-88130/1
Matrix: Water
Analysis Batch: 88130

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	5000	5270		ug/L		105	80 - 120
Chromium	1000	1040		ug/L		104	80 - 120
Sodium	20000	19800		ug/L		99	80 - 120

Lab Sample ID: LCSD 360-88130/13
Matrix: Water
Analysis Batch: 88130

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	5000	5230		ug/L		105	80 - 120	1	20
Chromium	1000	1030		ug/L		103	80 - 120	0	20
Sodium	20000	19900		ug/L		99	80 - 120	0	20

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Method: 300.0 - Nitrate & Nitrite

Lab Sample ID: MB 360-87884/3
Matrix: Water
Analysis Batch: 87884

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.050	0.050	mg/L			02/24/12 14:53	1
Nitrite as N	ND		0.010	0.010	mg/L			02/24/12 14:53	1

Lab Sample ID: LCS 360-87884/4
Matrix: Water
Analysis Batch: 87884

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	4.00	3.99		mg/L		100	85 - 115
Nitrite as N	4.00	4.06		mg/L		102	85 - 115

Method: 300.0 - Chloride & Sulfate

Lab Sample ID: MB 360-87810/3
Matrix: Water
Analysis Batch: 87810

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0	2.0	mg/L			02/24/12 14:52	1
Chloride	ND		1.0	1.0	mg/L			02/24/12 14:52	1

Lab Sample ID: LCS 360-87810/4
Matrix: Water
Analysis Batch: 87810

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	80.0	80.2		mg/L		100	85 - 115
Chloride	40.0	40.6		mg/L		101	85 - 115

Method: L107-06-1B - Nitrogen Ammonia

Lab Sample ID: MB 360-87823/1-A
Matrix: Water
Analysis Batch: 87850

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 87823

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.10	0.10	mg/L		02/27/12 10:48	02/27/12 15:28	1

Lab Sample ID: LCS 360-87823/2-A
Matrix: Water
Analysis Batch: 87850

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 87823

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	10.0	10.9		mg/L		109	90 - 110

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: MB 360-87959/3
Matrix: Water
Analysis Batch: 87959

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			03/01/12 09:22	1

Lab Sample ID: LCS 360-87959/1
Matrix: Water
Analysis Batch: 87959

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Specific Conductance			1410	1400		umhos/cm		99	85 - 115		

DILUTION LOGS

TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 2/24/12

Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Serial Dilution				Comments
									Sample Aliquot 2	Units	Final Volume 2	Units	
AMB	2/24/12	300.0	39255A1	10x	1	mL	10	mL					
			2										
			3										
			4										
			5										
			6										
↓	↓	↓	7	↓	↓	↓	↓	↓					

entries completed by day [new page each day]

TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 2/24/12

Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Serial Dilution				Comments
									Sample Aliquot 2	Units	Final Volume 2	Units	
AMB	2/24/12	300.0	39255#1	10x	1	mL	10	mL					
			2										
			3										
			4										
			5										
			6										
↓	↓	↓	7	↓	↓	↓	↓	↓					

entries completed by day [new page each day]

TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 2-27-12

Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Serial Dilution: Sample Aliquot 2	Serial Dilution: Units	Serial Dilution: Final Volume 2	Serial Dilution: Units	Comments
RwE	2-27-12	NH3	39255C2A	10X	1	mL	10	mL					
			C3A										
			C4A										
			C5A										
			C6A										
			C7A										
			39262C1A	~~500x~~	~~500~~ 1	mL	10	mL					
			C2A	10X	1	mL	10	mL					
			C2B MS										
			C2C MSD										
			C3A										

entries completed by day [new page each day]

022e

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-ISCO3-SW

Lab Sample ID: 360-39255-1

Date Collected: 02/23/12 07:20

Matrix: Water

Date Received: 02/23/12 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			87766	02/24/12 09:45	OG	TAL WFD
Total/NA	Analysis	6010C		1	87865	02/27/12 12:54	TJS	TAL WFD
Total/NA	Analysis	6010C		1	88128	03/06/12 15:47	TJS	TAL WFD
Dissolved	Analysis	6010C		1	88130	03/06/12 16:39	TJS	TAL WFD
Total/NA	Analysis	300.0		1	87810	02/24/12 16:53	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87810	02/24/12 17:10	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		1	87850	02/27/12 15:34	RWE	TAL WFD
Total/NA	Analysis	300.0		1	87884	02/24/12 16:53	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87884	02/24/12 17:10	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:29	AMS	TAL WFD

Client Sample ID: OC-ISCO2-SW

Lab Sample ID: 360-39255-2

Date Collected: 02/23/12 07:40

Matrix: Water

Date Received: 02/23/12 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			87766	02/24/12 09:45	OG	TAL WFD
Total/NA	Analysis	6010C		1	87865	02/27/12 12:57	TJS	TAL WFD
Total/NA	Analysis	6010C		1	88128	03/06/12 15:51	TJS	TAL WFD
Dissolved	Analysis	6010C		1	88130	03/06/12 16:42	TJS	TAL WFD
Total/NA	Analysis	300.0		10	87810	02/24/12 17:45	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	87850	02/27/12 15:52	RWE	TAL WFD
Total/NA	Analysis	300.0		1	87884	02/24/12 17:27	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87884	02/24/12 17:45	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:30	AMS	TAL WFD

Client Sample ID: OC-SW-PZ16RR-SW

Lab Sample ID: 360-39255-3

Date Collected: 02/23/12 08:00

Matrix: Water

Date Received: 02/23/12 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			87766	02/24/12 09:45	OG	TAL WFD
Total/NA	Analysis	6010C		1	87865	02/27/12 13:00	TJS	TAL WFD
Total/NA	Analysis	6010C		1	88128	03/06/12 15:54	TJS	TAL WFD
Dissolved	Analysis	6010C		1	88130	03/06/12 16:51	TJS	TAL WFD
Total/NA	Analysis	300.0		10	87810	02/24/12 18:53	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	87850	02/27/12 15:53	RWE	TAL WFD
Total/NA	Analysis	300.0		1	87884	02/24/12 18:02	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87884	02/24/12 18:53	AMS	TAL WFD

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-SW-PZ16RR-SW

Lab Sample ID: 360-39255-3

Date Collected: 02/23/12 08:00

Matrix: Water

Date Received: 02/23/12 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:32	AMS	TAL WFD

Client Sample ID: OC-SW-PZ-17RR-SW

Lab Sample ID: 360-39255-4

Date Collected: 02/23/12 08:20

Matrix: Water

Date Received: 02/23/12 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			87766	02/24/12 09:45	OG	TAL WFD
Total/NA	Analysis	6010C		1	87865	02/27/12 13:09	TJS	TAL WFD
Total/NA	Analysis	6010C		1	88128	03/06/12 15:57	TJS	TAL WFD
Dissolved	Analysis	6010C		1	88130	03/06/12 16:54	TJS	TAL WFD
Total/NA	Analysis	300.0		10	87810	02/24/12 19:27	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	87850	02/27/12 15:54	RWE	TAL WFD
Total/NA	Analysis	300.0		1	87884	02/24/12 19:10	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87884	02/24/12 19:27	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:33	AMS	TAL WFD

Client Sample ID: OC-SD-17-SW

Lab Sample ID: 360-39255-5

Date Collected: 02/23/12 08:45

Matrix: Water

Date Received: 02/23/12 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			87766	02/24/12 09:45	OG	TAL WFD
Total/NA	Analysis	6010C		1	87865	02/27/12 13:12	TJS	TAL WFD
Total/NA	Analysis	6010C		1	88128	03/06/12 16:00	TJS	TAL WFD
Dissolved	Analysis	6010C		1	88130	03/06/12 16:57	TJS	TAL WFD
Total/NA	Analysis	300.0		10	87810	02/24/12 20:01	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	87850	02/27/12 15:55	RWE	TAL WFD
Total/NA	Analysis	300.0		1	87884	02/24/12 19:44	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87884	02/24/12 20:01	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:35	AMS	TAL WFD

Client Sample ID: OC-PZ18R-SW

Lab Sample ID: 360-39255-6

Date Collected: 02/23/12 08:55

Matrix: Water

Date Received: 02/23/12 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			87766	02/24/12 09:45	OG	TAL WFD
Total/NA	Analysis	6010C		1	87865	02/27/12 13:15	TJS	TAL WFD
Total/NA	Analysis	6010C		1	88128	03/06/12 16:03	TJS	TAL WFD
Dissolved	Analysis	6010C		1	88130	03/06/12 17:00	TJS	TAL WFD

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Client Sample ID: OC-PZ18R-SW

Lab Sample ID: 360-39255-6

Date Collected: 02/23/12 08:55
Matrix: Water
Date Received: 02/23/12 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10	87810	02/24/12 20:36	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	87850	02/27/12 15:56	RWE	TAL WFD
Total/NA	Analysis	300.0		1	87884	02/24/12 20:19	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87884	02/24/12 20:36	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:36	AMS	TAL WFD

Client Sample ID: OC-ISCO1-SW

Lab Sample ID: 360-39255-7

Date Collected: 02/23/12 09:05
Matrix: Water
Date Received: 02/23/12 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			87766	02/24/12 09:45	OG	TAL WFD
Total/NA	Analysis	6010C		1	87865	02/27/12 13:18	TJS	TAL WFD
Total/NA	Analysis	6010C		1	88128	03/06/12 16:06	TJS	TAL WFD
Dissolved	Analysis	6010C		1	88130	03/06/12 17:03	TJS	TAL WFD
Total/NA	Analysis	300.0		10	87810	02/24/12 21:10	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	87850	02/27/12 15:57	RWE	TAL WFD
Total/NA	Analysis	300.0		1	87884	02/24/12 20:53	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87884	02/24/12 21:10	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:45	AMS	TAL WFD

Laboratory References:

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

Certification Summary

Client: Olin Corporation
Project/Site: Olin Chemical Surface water Quarterly

TestAmerica Job ID: 360-39255-1

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Westfield	Connecticut	State Program	1	PH-0494
TestAmerica Westfield	Maine	State Program	1	MA00014
TestAmerica Westfield	Massachusetts	State Program	1	M-MA014
TestAmerica Westfield	New Hampshire	NELAC	1	2539
TestAmerica Westfield	New York	NELAC	2	10843
TestAmerica Westfield	Rhode Island	State Program	1	LAO00057
TestAmerica Westfield	Vermont	State Program	1	VT-10843

Accreditation may not be offered or required for all methods and analytes reported in this package . Please contact your project manager for the laboratory's current list of certified methods and analytes.

State Accreditation Matrix

Method Name	Description	State where **Primary** Accreditation is Carried		
		New Hampshire (NELAC)	Mass	Conn
SM 4500 Cl F	Chlorine, Residual		NP	
SM 9215E	Heterotrophic Plate Count (SimPlate)		P	
SM 9222D	Coliforms, Fecal (Membrane Filter)		NP	
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		P	
SM 9223	Coliforms, Total, and E.Coli (Enumeration)		P	
1103.1	E.coli		ambient/ source	
Enterolert	Enterococcus			
200.8 Rev 5.4	Metals (ICP/MS) (list upon request)	NP/P	NP/P	
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P	
6010B/C	Metals (ICP)(list upon request)	NP/SW		
245.1	Mercury (CVAA)	NP/P	NP	
7470A	Mercury (CVAA)	NP		
7471A	Mercury (CVAA)	SW		
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		
3010A	Preparation, Total Metals	NP/P		
3020A	Preparation, Total Metals	NP/P/SW		
3050B	Preparation, Metals	SW		
504.1	EDB, DBCP and 1,2,3-TCP (GC)	P	P	
608	Organochlorine Pest/PCBs (list upon request)	NP	NP	
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP	NP	
3546	Microwave Extraction	SW		
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP		
8081A/B	Organochlorine Pesticides (GC)(list upon request)	NP/SW		
8082/A	PCBs by Gas Chromatography(list upon request)	NP/SW		
8270C/D	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)	NP/SW		NP/SW
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)	NP/SW		
524.2	Volatile Org Comp (GC/MS)(list upon request)	P	P	
524.2	Trihalomethane compounds	P	P	
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP	
5035	Closed System Purge and Trap	SW		
5030B	Purge and Trap	NP		
8260B/C	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)			
180.1	Turbidity, Nephelometric	P	P	
300	Anions, Ion Chromatography	NP/P	NP/P	
410.4	COD	NP	NP	
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW		
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP	
7196A	Chromium, Hexavalent	NP/SW		
9012A	Cyanide, Total and/or Amenable	NP/SW		
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP		
9045C	pH	SW		
L107041C	Nitrogen, Nitrate	NP	P	
L107-06-1B	Nitrogen Ammonia	NP	NP	
L204001A CN	Cyanide, Total	P	NP/P	
L210-001A	Phenolics, Total Recoverable	NP	NP	
SM 2320B	Alkalinity	NP/P	NP/P	
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	
SM 3500 CR D	Chromium, Hexavalent	NP		
SM 4500 H+ B	pH	NP/P	NP/P	
SM 4500 NO2 B	Nitrogen, Nitrite	NP	P	
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP	
SM 4500 P E	Phosphorus, Total	NP	NP	
SM 4500 S2 D	Sulfide, Total	NP		
SM 5210B	BOD, 5-Day	NP	NP	
SM 5310B	Organic Carbon, Total (TOC)	NP/P	NP	

Not all organic compounds are accreditied under NELAC
For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory

The lab carries additional accreditations with several states. This is the laboratories typcial listing but is subject to change based on the laboratories current certification standing.

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 360-39255-1

Login Number: 39255

List Source: TestAmerica Westfield

List Number: 1

Creator: Ard, Vanessa L

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica Westfield
Westfield Executive Park 53 Southampton Road
Westfield, MA 01085
Phone (413) 572-4000 Fax (413) 572-3707

Boston Service Center
240 Bear Hill Rd. Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information

Client Contact:	James Cashwell
Company:	olin Corp
Address:	51 Eames st
City:	Wilmington
State, Zip:	MA 01887
Phone:	978 658 6121
Email:	
Project Name/number:	Quarterly surface water
Site:	wilmington, MA
Sampler:	Brian Guichard / Leroy Johnson
Phone:	9786586121
Lab PM:	
E-Mail:	
Carrier Tracking No(s):	
COC No:	21067
Page:	
Job #:	
Due Date Requested:	
TAT Requested (days):	
Quote #:	
PO #:	
WO #:	
SSOW#:	

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Sampler's Initials	Field Filtered Sample?	Perform MS/MSD?	Lach-10-107-06-1-B Ammonia	6010B - filtered - Al/Cr/Na	2510B Spec. Cond. 300.0 28D SO4/Cl	300.0 48 Hr NO3/NO2	6010B Total Al/Cr/Na	Total Number of containers	Special Instructions/Note:
				Preservation Code:	X	X	X	S	D	N		D		
OC-~~SW~~-ISCO3 SW	2-23-12	7:20	G	W				X	X	X		X	3	
OC-~~SW~~-ISCO2 SW	↓	7:40	↓	↓				X	X	X		X	3	
OC-~~SW~~-PZ16RRSW	↓	8:00	↓	↓				X	X	X		X	3	
OC-SW-PZ-17RRSW	↓	8:20	↓	↓				X	X	X		X	3	
OC-~~SW~~-SD-17 SW	↓	8:45	↓	↓				X	X	X		X	3	
OC-PZ15RSW	↓	8:55	↓	↓				X	X	X		X	3	
OC-ISCO1 SW	↓	9:05	↓	↓				X	X	X		X	3	

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, H - Ascorbic Acid, I - Ice, J - DI Water, M - Hexane, N - None, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, Z - other (specify)

Regulatory programs: ☐ MCP ☐ RCP ☐ DEP Form ☐ GW1/S1 ☐ CT RSR ☐ EDD Required

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ______ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Brian Guichard	2-23-12 1220		Leroy Dale	2-23-12 1220	
Leroy Dale	2-23-12 1140		[illegible]	2/23/12 1645	

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks: 6.0 / IR

TAL-8245-360 1111

3/8/2012

FILE COPY

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Westfield
Westfield Executive Park
53 Southampton Road
Westfield, MA 01085
Tel: (413)572-4000

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY:

TestAmerica Job ID: 360-39262-1
Client Project/Site: Olin Chemical Quarterly Groundwater

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
3/8/2012 10:42:15 AM
Joe Chimi
Report Production Representative
joe.chimi@testamericainc.com

Designee for

Becky Mason
Project Manager II
becky.mason@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Job ID: 360-39262-1

Laboratory: TestAmerica Westfield

Narrative

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 02/23/2012; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 6.0 C.

DISSOLVED METALS (ICP)
Samples OC-GW-202D (360-39262-1), OC-GW-202S (360-39262-2), OC-GW-202SDUP (360-39262-3), OC-PZ-25 (360-39262-4) and OC-PZ-24 (360-39262-5) were analyzed for dissolved metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were analyzed on 03/06/2012.

Sample OC-GW-202D (360-39262-1)[2X] required dilution prior to analysis due to high target concentration. The reporting limits have been adjusted accordingly.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No difficulties were encountered during the metals (ICP) analyses.

All quality control parameters were within the acceptance limits.

ANIONS (28 DAY HOLD TIME)
Samples OC-GW-202D (360-39262-1), OC-GW-202S (360-39262-2), OC-GW-202SDUP (360-39262-3), OC-PZ-25 (360-39262-4) and OC-PZ-24 (360-39262-5) were analyzed for anions (28 day hold time) in accordance with EPA Method 300.0. The samples were analyzed on 02/28/2012 and 03/02/2012.

Chloride and Sulfate failed the recovery criteria high for the MS of sample OC-GW-202S (360-39262-2) in batch 360-88087. Chloride exceeded the rpd limit for the MSD of sample OC-GW-202SMSD (360-39262-2) in batch 360-88087. The associated LCS recovered within control limits. Refer to the QC report for details.

Samples OC-GW-202D (360-39262-1)[10X], OC-GW-202D (360-39262-1)[50X], OC-GW-202S (360-39262-2)[10X], OC-GW-202SDUP (360-39262-3)[10X], OC-PZ-25 (360-39262-4)[10X] and OC-PZ-24 (360-39262-5)[10X] required dilution prior to analysis due to high target concentration. The reporting limits have been adjusted accordingly.

No other difficulties were encountered during the anions analyses.

All other quality control parameters were within the acceptance limits.

AMMONIA
Samples OC-GW-202D (360-39262-1), OC-GW-202S (360-39262-2), OC-GW-202SDUP (360-39262-3), OC-PZ-25 (360-39262-4) and OC-PZ-24 (360-39262-5) were analyzed for ammonia in accordance with Lachat 107-06-1B. The samples were prepared on 02/27/2012 and 03/02/2012 and analyzed on 02/27/2012 and 03/05/2012.

Ammonia failed the recovery criteria low for the MS of sample OC-GW-202S (360-39262-2) in batch 360-87850. Ammonia failed the recovery criteria high for the MSD of sample OC-GW-202S (360-39262-2) in batch 360-87850 and exceeded the rpd limit. The associated LCS recovered within control limits. Refer to the QC report for details.

Job ID: 360-39262-1 (Continued)

Laboratory: TestAmerica Westfield (Continued)

Samples OC-GW-202D (360-39262-1)[20X], OC-GW-202S (360-39262-2)[10X], OC-GW-202SDUP (360-39262-3)[10X], OC-PZ-25 (360-39262-4)[10X] and OC-PZ-24 (360-39262-5)[10X] required dilution prior to analysis due to high concentration. The reporting limits have been adjusted accordingly.

No other difficulties were encountered during the ammonia analyses.

All other quality control parameters were within the acceptance limits.

SPECIFIC CONDUCTIVITY

Samples OC-GW-202D (360-39262-1), OC-GW-202S (360-39262-2), OC-GW-202SDUP (360-39262-3), OC-PZ-25 (360-39262-4) and OC-PZ-24 (360-39262-5) were analyzed for specific conductivity in accordance with SM20 2510B. The samples were analyzed on 03/01/2012.

No difficulties were encountered during the conductivity analyses.

All quality control parameters were within the acceptance limits.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Westfield** Project #: **360-39262-1**

Project Location: **Wilmington** RTN:

This form provides certifications for the following data set: list Laboratory Sample ID Number(s):

360-39262-(1-5)

Matrices: [X] Groundwater/Surface Water [ ] Soil/Sediment [ ] Drinking Water [ ] Air [ ] Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A [ ]	7470/7471 Hg CAM III B [ ]	Mass DEP VPH CAM IV A [ ]	8081 Pesticides CAM V B [ ]	7196 Hex Cr CAM VI B [ ]	Mass DEP APH CAM IX A [ ]
8270 SVOC CAM II B [ ]	7010 Metals CAM III C [ ]	Mass DEP EPH CAM IV B [ ]	8151 Herbicides CAM V C [ ]	8330 Explosives CAM VIII A [ ]	TO-15 VOC CAM IX B [ ]
6010 Metals CAM III A [X]	6020 Metals CAM III D [ ]	8082 PCB CAM V A [ ]	9014 Total Cyanide/PAC CAM VI A [ ]	6860 Perchlorate CAM VIII B [ ]	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	[X] Yes [ ] No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	[X] Yes [ ] No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	[X] Yes [ ] No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	[X] Yes [ ] No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	[ ] Yes [ ] No [ ] Yes [ ] No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	[X] Yes [ ] No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

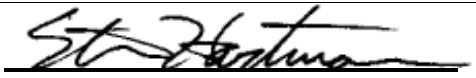
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	[X] Yes [ ] No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	[X] Yes [ ] No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	[ ] Yes [X] No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature:  Position: Laboratory Director

Printed Name: Steven C. Hartmann Date: 3/8/12 10:25

This form has been electronically signed and approved

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Client Sample ID: OC-GW-202D — Lab Sample ID: 360-39262-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	14000		200	26	ug/L	2		6010C	Dissolved
Chromium	980		10	1.3	ug/L	2		6010C	Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	1800		100	100	mg/L	50		300.0	Total/NA
Chloride	280		10	10	mg/L	10		300.0	Total/NA
Ammonia	310		2.0	2.0	mg/L	20		L107-06-1B	Total/NA
Specific Conductance	4500		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW-202S — Lab Sample ID: 360-39262-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	3.3	J	5.0	0.66	ug/L	1		6010C	Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	360		20	20	mg/L	10		300.0	Total/NA
Chloride	47		1.0	1.0	mg/L	1		300.0	Total/NA
Ammonia	73		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1100		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW-202SDUP — Lab Sample ID: 360-39262-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	3.4	J	5.0	0.66	ug/L	1		6010C	Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	350		20	20	mg/L	10		300.0	Total/NA
Chloride	46		1.0	1.0	mg/L	1		300.0	Total/NA
Ammonia	66		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1100		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-25 — Lab Sample ID: 360-39262-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	8.0		5.0	0.66	ug/L	1		6010C	Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	460		20	20	mg/L	10		300.0	Total/NA
Chloride	19		1.0	1.0	mg/L	1		300.0	Total/NA
Ammonia	46		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1300		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-24 — Lab Sample ID: 360-39262-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	23		5.0	0.66	ug/L	1		6010C	Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	720		20	20	mg/L	10		300.0	Total/NA
Chloride	26		1.0	1.0	mg/L	1		300.0	Total/NA
Ammonia	60		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1900		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Method Summary

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL WFD
300.0	Chloride & Sulfate	40CFR136A	TAL WFD
L107-06-1B	Nitrogen Ammonia	LACHAT	TAL WFD
SM 2510B	Conductivity, Specific Conductance	SM	TAL WFD

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

Sample Summary

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
360-39262-1	OC-GW-202D	Water	02/22/12 07:55	02/23/12 16:45
360-39262-2	OC-GW-202S	Water	02/22/12 08:30	02/23/12 16:45
360-39262-3	OC-GW-202SDUP	Water	02/22/12 08:30	02/23/12 16:45
360-39262-4	OC-PZ-25	Water	02/22/12 10:30	02/23/12 16:45
360-39262-5	OC-PZ-24	Water	02/22/12 11:10	02/23/12 16:45

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Client Sample ID: OC-GW-202D
Date Collected: 02/22/12 07:55
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39262-1
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	14000		200	26	ug/L			03/06/12 17:06	2
Chromium	980		10	1.3	ug/L			03/06/12 17:06	2

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1800		100	100	mg/L			03/02/12 15:57	50
Chloride	280		10	10	mg/L			02/28/12 02:45	10
Ammonia	310		2.0	2.0	mg/L		02/27/12 10:48	02/27/12 15:58	20
Specific Conductance	4500		1.0	1.0	umhos/cm			03/01/12 09:46	1

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Client Sample ID: OC-GW-202S
Date Collected: 02/22/12 08:30
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39262-2
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/06/12 16:19	1
Chromium	**3.3**	**J**	5.0	0.66	ug/L			03/06/12 16:19	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**360**		20	20	mg/L			03/02/12 12:15	10
Chloride	**47**		1.0	1.0	mg/L			03/02/12 11:58	1
Ammonia	**73**		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 15:59	10
Specific Conductance	**1100**		1.0	1.0	umhos/cm			03/01/12 09:42	1

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Client Sample ID: OC-GW-202SDUP
Lab Sample ID: 360-39262-3
Date Collected: 02/22/12 08:30
Matrix: Water
Date Received: 02/23/12 16:45

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/06/12 16:30	1
Chromium	**3.4**	**J**	5.0	0.66	ug/L			03/06/12 16:30	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**350**		20	20	mg/L			02/28/12 03:19	10
Chloride	**46**		1.0	1.0	mg/L			02/28/12 03:02	1
Ammonia	**66**		1.0	1.0	mg/L		02/27/12 10:48	02/27/12 16:04	10
Specific Conductance	**1100**		1.0	1.0	umhos/cm			03/01/12 09:48	1

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Client Sample ID: OC-PZ-25
Date Collected: 02/22/12 10:30
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39262-4
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/06/12 16:33	1
Chromium	**8.0**		5.0	0.66	ug/L			03/06/12 16:33	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**460**		20	20	mg/L			02/28/12 03:53	10
Chloride	**19**		1.0	1.0	mg/L			02/28/12 03:36	1
Ammonia	**46**		1.0	1.0	mg/L		03/02/12 12:16	03/05/12 17:30	10
Specific Conductance	**1300**		1.0	1.0	umhos/cm			03/01/12 09:49	1

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Client Sample ID: OC-PZ-24
Date Collected: 02/22/12 11:10
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39262-5
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/06/12 16:36	1
Chromium	**23**		5.0	0.66	ug/L			03/06/12 16:36	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**720**		20	20	mg/L			02/28/12 18:59	10
Chloride	**26**		1.0	1.0	mg/L			02/28/12 18:42	1
Ammonia	**60**		1.0	1.0	mg/L		03/02/12 12:16	03/05/12 17:31	10
Specific Conductance	**1900**		1.0	1.0	umhos/cm			03/01/12 09:51	1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
F	MS or MSD exceeds the control limits
F	RPD of the MS and MSD exceeds the control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Metals

Analysis Batch: 88130

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39262-1	OC-GW-202D	Dissolved	Water	6010C	
360-39262-2	OC-GW-202S	Dissolved	Water	6010C	
360-39262-2 MS	OC-GW-202S	Dissolved	Water	6010C	
360-39262-2 MSD	OC-GW-202S	Dissolved	Water	6010C	
360-39262-3	OC-GW-202SDUP	Dissolved	Water	6010C	
360-39262-4	OC-PZ-25	Dissolved	Water	6010C	
360-39262-5	OC-PZ-24	Dissolved	Water	6010C	
LCS 360-88130/1	Lab Control Sample	Total/NA	Water	6010C	
LCSD 360-88130/13	Lab Control Sample Dup	Total/NA	Water	6010C	
MB 360-88130/2	Method Blank	Total/NA	Water	6010C	

General Chemistry

Prep Batch: 87823

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39262-1	OC-GW-202D	Total/NA	Water	Distill/Ammonia	
360-39262-2	OC-GW-202S	Total/NA	Water	Distill/Ammonia	
360-39262-2 MS	OC-GW-202S	Total/NA	Water	Distill/Ammonia	
360-39262-2 MSD	OC-GW-202S	Total/NA	Water	Distill/Ammonia	
360-39262-3	OC-GW-202SDUP	Total/NA	Water	Distill/Ammonia	
LCS 360-87823/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 360-87823/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 87850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39262-1	OC-GW-202D	Total/NA	Water	L107-06-1B	87823
360-39262-2	OC-GW-202S	Total/NA	Water	L107-06-1B	87823
360-39262-2 MS	OC-GW-202S	Total/NA	Water	L107-06-1B	87823
360-39262-2 MSD	OC-GW-202S	Total/NA	Water	L107-06-1B	87823
360-39262-3	OC-GW-202SDUP	Total/NA	Water	L107-06-1B	87823
LCS 360-87823/2-A	Lab Control Sample	Total/NA	Water	L107-06-1B	87823
MB 360-87823/1-A	Method Blank	Total/NA	Water	L107-06-1B	87823

Analysis Batch: 87944

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39262-1	OC-GW-202D	Total/NA	Water	300.0	
360-39262-3	OC-GW-202SDUP	Total/NA	Water	300.0	
360-39262-3	OC-GW-202SDUP	Total/NA	Water	300.0	
360-39262-4	OC-PZ-25	Total/NA	Water	300.0	
360-39262-4	OC-PZ-25	Total/NA	Water	300.0	
LCS 360-87944/6	Lab Control Sample	Total/NA	Water	300.0	
MB 360-87944/5	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 87947

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39262-5	OC-PZ-24	Total/NA	Water	300.0	
360-39262-5	OC-PZ-24	Total/NA	Water	300.0	
LCS 360-87947/4	Lab Control Sample	Total/NA	Water	300.0	
MB 360-87947/3	Method Blank	Total/NA	Water	300.0	

General Chemistry (Continued)

Analysis Batch: 87959

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39262-1	OC-GW-202D	Total/NA	Water	SM 2510B	
360-39262-2	OC-GW-202S	Total/NA	Water	SM 2510B	
360-39262-2 DU	OC-GW-202S	Total/NA	Water	SM 2510B	
360-39262-3	OC-GW-202SDUP	Total/NA	Water	SM 2510B	
360-39262-4	OC-PZ-25	Total/NA	Water	SM 2510B	
360-39262-5	OC-PZ-24	Total/NA	Water	SM 2510B	
LCS 360-87959/1	Lab Control Sample	Total/NA	Water	SM 2510B	
MB 360-87959/3	Method Blank	Total/NA	Water	SM 2510B	

Prep Batch: 88011

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39262-4	OC-PZ-25	Total/NA	Water	Distill/Ammonia	
360-39262-5	OC-PZ-24	Total/NA	Water	Distill/Ammonia	
LCS 360-88011/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 360-88011/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 88087

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39262-1	OC-GW-202D	Total/NA	Water	300.0	
360-39262-2	OC-GW-202S	Total/NA	Water	300.0	
360-39262-2	OC-GW-202S	Total/NA	Water	300.0	
360-39262-2 MS	OC-GW-202S	Total/NA	Water	300.0	
360-39262-2 MSD	OC-GW-202S	Total/NA	Water	300.0	
LCS 360-88087/4	Lab Control Sample	Total/NA	Water	300.0	
MB 360-88087/3	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 88088

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39262-4	OC-PZ-25	Total/NA	Water	L107-06-1B	88011
360-39262-5	OC-PZ-24	Total/NA	Water	L107-06-1B	88011
LCS 360-88011/2-A	Lab Control Sample	Total/NA	Water	L107-06-1B	88011
MB 360-88011/1-A	Method Blank	Total/NA	Water	L107-06-1B	88011

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 360-88130/2
Matrix: Water
Analysis Batch: 88130

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/06/12 16:13	1
Chromium	ND		5.0	0.66	ug/L			03/06/12 16:13	1

Lab Sample ID: LCS 360-88130/1
Matrix: Water
Analysis Batch: 88130

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	5000	5270		ug/L		105	80 - 120
Chromium	1000	1040		ug/L		104	80 - 120

Lab Sample ID: LCSD 360-88130/13
Matrix: Water
Analysis Batch: 88130

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	5000	5230		ug/L		105	80 - 120	1	20
Chromium	1000	1030		ug/L		103	80 - 120	0	20

Lab Sample ID: 360-39262-2 MS
Matrix: Water
Analysis Batch: 88130

Client Sample ID: OC-GW-202S
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	ND		5000	5260		ug/L		105	75 - 125
Chromium	3.3	J	1000	1010		ug/L		101	75 - 125

Lab Sample ID: 360-39262-2 MSD
Matrix: Water
Analysis Batch: 88130

Client Sample ID: OC-GW-202S
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	ND		5000	5250		ug/L		105	75 - 125	0	20
Chromium	3.3	J	1000	1010		ug/L		101	75 - 125	0	20

Method: 300.0 - Chloride & Sulfate

Lab Sample ID: MB 360-87944/5
Matrix: Water
Analysis Batch: 87944

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0	2.0	mg/L			02/27/12 21:37	1
Chloride	ND		1.0	1.0	mg/L			02/27/12 21:37	1

Lab Sample ID: LCS 360-87944/6
Matrix: Water
Analysis Batch: 87944

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	80.0	80.6		mg/L		101	85 - 115

Method: 300.0 - Chloride & Sulfate (Continued)

Lab Sample ID: LCS 360-87944/6
Matrix: Water
Analysis Batch: 87944

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	40.0	40.5		mg/L		101	85 - 115

Lab Sample ID: MB 360-87947/3
Matrix: Water
Analysis Batch: 87947

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0	2.0	mg/L			02/28/12 16:59	1
Chloride	ND		1.0	1.0	mg/L			02/28/12 16:59	1

Lab Sample ID: LCS 360-87947/4
Matrix: Water
Analysis Batch: 87947

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	80.0	81.6		mg/L		102	85 - 115
Chloride	40.0	40.8		mg/L		102	85 - 115

Lab Sample ID: MB 360-88087/3
Matrix: Water
Analysis Batch: 88087

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0	2.0	mg/L			03/02/12 11:06	1
Chloride	ND		1.0	1.0	mg/L			03/02/12 11:06	1

Lab Sample ID: LCS 360-88087/4
Matrix: Water
Analysis Batch: 88087

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	80.0	81.4		mg/L		102	85 - 115
Chloride	40.0	40.7		mg/L		102	85 - 115

Lab Sample ID: 360-39262-2 MS
Matrix: Water
Analysis Batch: 88087

Client Sample ID: OC-GW-202S
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	360		200	633	F	mg/L		137	75 - 125
Chloride	45		100	171	F	mg/L		126	75 - 125

Lab Sample ID: 360-39262-2 MSD
Matrix: Water
Analysis Batch: 88087

Client Sample ID: OC-GW-202S
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	360		200	518		mg/L		80	75 - 125	20	20
Chloride	45		100	139	F	mg/L		94	75 - 125	21	20

Method: L107-06-1B - Nitrogen Ammonia

Lab Sample ID: MB 360-87823/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 87850 — **Prep Batch: 87823**

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.10	0.10	mg/L		02/27/12 10:48	02/27/12 15:28	1

Lab Sample ID: LCS 360-87823/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 87850 — **Prep Batch: 87823**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	10.0	10.9		mg/L		109	90 - 110

Lab Sample ID: 360-39262-2 MS — **Client Sample ID: OC-GW-202S**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 87850 — **Prep Batch: 87823**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	73		10.0	76.9	4	mg/L		38	90 - 110

Lab Sample ID: 360-39262-2 MSD — **Client Sample ID: OC-GW-202S**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 87850 — **Prep Batch: 87823**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia	73		10.0	98.0	4 F	mg/L		248	90 - 110	24	20

Lab Sample ID: MB 360-88011/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 88088 — **Prep Batch: 88011**

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.10	0.10	mg/L		03/02/12 12:16	03/05/12 17:04	1

Lab Sample ID: LCS 360-88011/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 88088 — **Prep Batch: 88011**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	10.0	10.3		mg/L		103	90 - 110

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: MB 360-87959/3 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 87959

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			03/01/12 09:22	1

Method: SM 2510B - Conductivity, Specific Conductance (Continued)

Lab Sample ID: LCS 360-87959/1
Matrix: Water
Analysis Batch: 87959

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Specific Conductance	1410	1400		umhos/cm		99	85 - 115

Lab Sample ID: 360-39262-2 DU
Matrix: Water
Analysis Batch: 87959

Client Sample ID: OC-GW-202S
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	1100		1110		umhos/cm		0.2	20

DILUTION LOGS

TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 2/27/12

Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Serial Dilution				Comments
									Sample Aliquot 2	Units	Final Volume 2	Units	
AMS	2/27/12	300.0	392621A1	10x	1	mL	10	mL					
↓	↓	↓	↓ 3	↓	↓	↓	↓	↓					
			↓ 4										

entries completed by day [new page each day]

TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 2/28/12

Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Serial Dilution				Comments
									Sample Aliquot 2	Units	Final Volume 2	Units	
MM	2/28/12	300.0	39262A2	10	1	mL	10	mL					
			MS										
			MSD										
			A5										
			39278D1	10	1	mL	10	mL					
			D2										

entries completed by day [new page each day]

TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 2/27/12

Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Serial Dilution				Comments
									Sample Aliquot 2	Units	Final Volume 2	Units	
AMS	2/27/12	300.0	392621A1	10x	1	mL	10	mL					
↓	↓	↓	↓ 3	↓	↓	↓	↓	↓					
			↓ 4										

entries completed by day [new page each day]

TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 2/28/12

Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Serial Dilution				Comments
									Sample Aliquot 2	Units	Final Volume 2	Units	
MM	2/28/12	300.0	39262 A2	10	1	mL	10	mL					
			MS										
			MSD										
			A5										
			39278 D1	10	1	mL	10	mL					
			D2										

entries completed by day [new page each day]

TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 3/2/12

Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Serial Dilution				Comments
									Sample Aliquot 2	Units	Final Volume 2	Units	
AMB	3/2/12	300.0	392662A2	10x	1	mL	10	mL					
			MS	10x		mL							
			MSD	10x		mL							
			392662A1	50x	200	µL							

entries completed by day [new page each day]

071g

TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 3-6-12

Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Serial Dilution				Comments
									Sample Aliquot 2	Units	Final Volume 2	Units	
TD	3-6-12	6010_D	39262-1	2X	5	mL	10	mL					

entries completed by day [new page each day]

055h

TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 2-27-12

Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Serial Dilution: Sample Aliquot 2	Serial Dilution: Units	Serial Dilution: Final Volume 2	Serial Dilution: Units	Comments
RwE	2-27-12	NH3	39255C2A	10X	1	mL	10	mL					
			C3A										
			C4A										
			C5A										
			C6A										
			C7A										
			39262C1A	~~500~~ 30X	~~500~~ 1	µL	10	mL					
			C2A	10X	1	mL	10	mL					
			C2B MS										
			C2C MSD										
			C3A										

entries completed by day [new page each day]

022e

TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 3-5-12

Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Serial Dilution				Comments
									Sample Aliquot 2	Units	Final Volume 2	Units	
RWE	3-5-12	NH3	39314A1	5x	2	mL	10	mL					
			MS	5x	2	↓	↓	↓					
			↓ MSD	5x	2								
			39262C4	10x	1								
			↓ CS	10x	1	↓	↓	↓					

entries completed by day [new page each day]

3/8/2012

023e

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Client Sample ID: OC-GW-202D

Lab Sample ID: 360-39262-1

Date Collected: 02/22/12 07:55

Matrix: Water

Date Received: 02/23/12 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		2	88130	03/06/12 17:06	TJS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		20	87850	02/27/12 15:58	RWE	TAL WFD
Total/NA	Analysis	300.0		10	87944	02/28/12 02:45	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:46	AMS	TAL WFD
Total/NA	Analysis	300.0		50	88087	03/02/12 15:57	AMS	TAL WFD

Client Sample ID: OC-GW-202S

Lab Sample ID: 360-39262-2

Date Collected: 02/22/12 08:30

Matrix: Water

Date Received: 02/23/12 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		1	88130	03/06/12 16:19	TJS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	87850	02/27/12 15:59	RWE	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:42	AMS	TAL WFD
Total/NA	Analysis	300.0		1	88087	03/02/12 11:58	AMS	TAL WFD
Total/NA	Analysis	300.0		10	88087	03/02/12 12:15	AMS	TAL WFD

Client Sample ID: OC-GW-202SDUP

Lab Sample ID: 360-39262-3

Date Collected: 02/22/12 08:30

Matrix: Water

Date Received: 02/23/12 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		1	88130	03/06/12 16:30	TJS	TAL WFD
Total/NA	Prep	Distill/Ammonia			87823	02/27/12 10:48	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	87850	02/27/12 16:04	RWE	TAL WFD
Total/NA	Analysis	300.0		1	87944	02/28/12 03:02	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87944	02/28/12 03:19	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:48	AMS	TAL WFD

Client Sample ID: OC-PZ-25

Lab Sample ID: 360-39262-4

Date Collected: 02/22/12 10:30

Matrix: Water

Date Received: 02/23/12 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		1	88130	03/06/12 16:33	TJS	TAL WFD
Total/NA	Analysis	300.0		1	87944	02/28/12 03:36	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87944	02/28/12 03:53	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:49	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88011	03/02/12 12:16	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	88088	03/05/12 17:30	RWE	TAL WFD

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Client Sample ID: OC-PZ-24
Date Collected: 02/22/12 11:10
Date Received: 02/23/12 16:45

Lab Sample ID: 360-39262-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		1	88130	03/06/12 16:36	TJS	TAL WFD
Total/NA	Analysis	300.0		1	87947	02/28/12 18:42	AMS	TAL WFD
Total/NA	Analysis	300.0		10	87947	02/28/12 18:59	AMS	TAL WFD
Total/NA	Analysis	SM 2510B		1	87959	03/01/12 09:51	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88011	03/02/12 12:16	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	88088	03/05/12 17:31	RWE	TAL WFD

Laboratory References:

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

Certification Summary

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Groundwater

TestAmerica Job ID: 360-39262-1

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Westfield	Connecticut	State Program	1	PH-0494
TestAmerica Westfield	Maine	State Program	1	MA00014
TestAmerica Westfield	Massachusetts	State Program	1	M-MA014
TestAmerica Westfield	New Hampshire	NELAC	1	2539
TestAmerica Westfield	New York	NELAC	2	10843
TestAmerica Westfield	Rhode Island	State Program	1	LAO00057
TestAmerica Westfield	Vermont	State Program	1	VT-10843

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

State Accreditation Matrix

Method Name	Description	State where **Primary** Accreditation is Carried		
		New Hampshire (NELAC)	Mass	Conn
SM 4500 Cl F	Chlorine, Residual		NP	
SM 9215E	Heterotrophic Plate Count (SimPlate)		P	
SM 9222D	Coliforms, Fecal (Membrane Filter)		NP	
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		P	
SM 9223	Coliforms, Total, and E.Coli (Enumeration)		P	
1103.1	E.coli		ambient/ source	
Enterolert	Enterococcus			
200.8 Rev 5.4	Metals (ICP/MS) (list upon request)	NP/P	NP/P	
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P	
6010B/C	Metals (ICP)(list upon request)	NP/SW		
245.1	Mercury (CVAA)	NP/P	NP	
7470A	Mercury (CVAA)	NP		
7471A	Mercury (CVAA)	SW		
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		
3010A	Preparation, Total Metals	NP/P		
3020A	Preparation, Total Metals	NP/P/SW		
3050B	Preparation, Metals	SW		
504.1	EDB, DBCP and 1,2,3-TCP (GC)	P	P	
608	Organochlorine Pest/PCBs (list upon request)	NP	NP	
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP	NP	
3546	Microwave Extraction	SW		
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP		
8081A/B	Organochlorine Pesticides (GC)(list upon request)	NP/SW		
8082/A	PCBs by Gas Chromatography(list upon request)	NP/SW		
8270C/D	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)	NP/SW		NP/SW
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)	NP/SW		
524.2	Volatile Org Comp (GC/MS)(list upon request)	P	P	
524.2	Trihalomethane compounds	P	P	
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP	
5035	Closed System Purge and Trap	SW		
5030B	Purge and Trap	NP		
8260B/C	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)			
180.1	Turbidity, Nephelometric	P	P	
300	Anions, Ion Chromatography	NP/P	NP/P	
410.4	COD	NP	NP	
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW		
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP	
7196A	Chromium, Hexavalent	NP/SW		
9012A	Cyanide, Total and/or Amenable	NP/SW		
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP		
9045C	pH	SW		
L107041C	Nitrogen, Nitrate	NP	P	
L107-06-1B	Nitrogen Ammonia	NP	NP	
L204001A CN	Cyanide, Total	P	NP/P	
L210-001A	Phenolics, Total Recoverable	NP	NP	
SM 2320B	Alkalinity	NP/P	NP/P	
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	
SM 3500 CR D	Chromium, Hexavalent	NP		
SM 4500 H+ B	pH	NP/P	NP/P	
SM 4500 NO2 B	Nitrogen, Nitrite	NP	P	
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP	
SM 4500 P E	Phosphorus, Total	NP	NP	
SM 4500 S2 D	Sulfide, Total	NP		
SM 5210B	BOD, 5-Day	NP	NP	
SM 5310B	Organic Carbon, Total (TOC)	NP/P	NP	

Not all organic compounds are accreditied under NELAC
For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory

The lab carries additional accreditations with several states. This is the laboratories typcial listing but is subject to change based on the laboratories current certification standing.

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 360-39262-1

Login Number: 39262

List Source: TestAmerica Westfield

List Number: 1

Creator: Ard, Vanessa L

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica Westfield
Westfield Executive Park 53 Southampton Road
Westfield, MA 01085
Phone (413) 572-4000 Fax (413) 572-3707

Boston Service Center
240 Bear Hill Rd. Suite 104
Waltham, MA 02451
Phone (781) 466-6900 Fax (781) 466-6901

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Brian Guichard	Lab PM:	Carrier Tracking No(s):	COC No: 21068
Client Contact: James Cashwell	Phone: 9786586121	E-Mail:		Page:
Company: Olin Corp				Job #:
Address: 51 Eames St	Due Date Requested:			
City: Wilmington	TAT Requested (days):			
State, Zip: MA 01887				
Phone: 9786586121	Quote #:			
Email:	PO #:			
Project Name/number: Quarterly Groundwater	WO #:			
Site: Wilmington	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; H - Ascorbic Acid; I - Ice; J - DI Water; M - Hexane; N - None; P - Na2O4S; Q - Na2SO3; R - Na2S2SO3; S - H2SO4; Z - other (specify)

Regulatory programs:
MCP ☐ GW1/S1 ☐
RCP ☐ CT RSR ☐
DEP Form ☐ EDD Required ☐

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Sampler's Initials	Field Filtered Sample?	Perform MS/MSD?	Lach_107-06-1-B Ammonia	6010B-filtered - Al/Cr	2510B spec cond 300.0/28 SO4/Cl	Total Number of containers	Special Instructions/Note:
				Preservation Code:	X	X	X					
GW 202D	2-22-12	7:55	G	W				X	X	X	3	
GW 202S	2-22-12	8:30	G	W				X	X	X	12	GW 202S includes
PZ-25	2-22-12	10:30	G	W				X	X	X	3	MS, MSD, Dup
PZ-24	2-22-12	11:10	G	W				X	X	X	3	

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ______ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Brian Guichard	2-23-12 1220		Jerry Peck	2-23-12 1220	
Jerry Peck	2-23-12 1045		[illegible]	2/23/12 1145	

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: [illegible]

TAL-8245-360 1111

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14 13 12 11 10 9 8 7 6 5 4 3 2 1

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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Westfield
Westfield Executive Park
53 Southampton Road
Westfield, MA 01085
Tel: (413)572-4000

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY:

TestAmerica Job ID: 360-39434-1
Client Project/Site: Olin Chemical

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
3/21/2012 11:49:25 AM
Joe Chimi
Report Production Representative
joe.chimi@testamericainc.com

Designee for

Becky Mason
Project Manager II
becky.mason@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Job ID: 360-39434-1

Laboratory: TestAmerica Westfield

Narrative

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

Receipt
The samples were received on 03/07/2012; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.6°C.

GC/MS VOA
Method 8260C: The following sample was diluted due to the abundance of target analytes: OC-GW 16R (360-39434-1). Elevated reporting limits (RLs) are provided.

At the request of the client, a non-MCP compound list was reported for this job.

No other analytical or quality issues were noted.

GC/MS Semi VOA
Method 8270D: The method blank for batch 88223 contained Bis(2-ethylhexyl) phthalate above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

The following sample was diluted due to the abundance of target analytes: OC-GW 16R (360-39434-1). Elevated reporting limits (RLs) are provided. Consequently, all surrogates were diluted outside control limits.

At the request of the client, an abbreviated MCP compound list was reported for this job.

No other analytical or quality issues were noted.

GC VOA
Method MAVPH: The calibration curve uses quadratic regressions for m-Xylene & p-Xylene and C9-C10 Aromatics.

The following sample was diluted due to foaming at the time of purging during the original sample analysis: OC-GW 16R (360-39434-1). Elevated reporting limits (RLs) are provided.

Samples (360-39434-1 MS), (360-39434-1 MSD) and OC-GW 16R (360-39434-1) had a pH<2.

No other analytical or quality issues were noted.

Metals
At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No analytical or quality issues were noted.

Field Service / Mobile Lab
No analytical or quality issues were noted.

General Chemistry
No analytical or quality issues were noted.

Job ID: 360-39434-1 (Continued)

Laboratory: TestAmerica Westfield (Continued)

Organic Prep

No analytical or quality issues were noted.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Westfield** Project #: **360-39434-1**

Project Location: **Olin Chemical Superfund Site** RTN:

This form provides certifications for the following data set: list Laboratory Sample ID Number(s):

360-39434-(1-3)

Matrices: [X] Groundwater/Surface Water [ ] Soil/Sediment [ ] Drinking Water [ ] Air [ ] Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A [X]	7470/7471 Hg CAM III B [ ]	Mass DEP VPH CAM IV A [X]	8081 Pesticides CAM V B [ ]	7196 Hex Cr CAM VI B [ ]	Mass DEP APH CAM IX A [ ]
8270 SVOC CAM II B [X]	7010 Metals CAM III C [ ]	Mass DEP EPH CAM IV B [ ]	8151 Herbicides CAM V C [ ]	8330 Explosives CAM VIII A [ ]	TO-15 VOC CAM IX B [ ]
6010 Metals CAM III A [X]	6020 Metals CAM III D [ ]	8082 PCB CAM V A [ ]	9014 Total Cyanide/PAC CAM VI A [ ]	6860 Perchlorate CAM VIII B [ ]	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	[X] Yes [ ] No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	[X] Yes [ ] No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	[X] Yes [ ] No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	[X] Yes [ ] No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	[X] Yes [ ] No [ ] Yes [ ] No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	[X] Yes [ ] No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

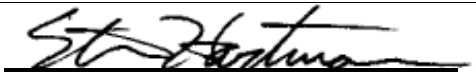
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	[ ] Yes [X] No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	[X] Yes [ ] No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	[ ] Yes [X] No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature:  Position: Laboratory Director

Printed Name: Steven C. Hartmann Date: 3/21/12 11:40

This form has been electronically signed and approved

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

Client Sample ID: OC-GW 16R — Lab Sample ID: 360-39434-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2,4,4-Trimethyl-1-pentene	1200		20	4.0	ug/L	20		8260C	Total/NA
2,4,4-Trimethyl-2-pentene	360		20	4.0	ug/L	20		8260C	Total/NA
N-Nitrosodiphenylamine - DL	330		94	9.4	ug/L	20		8270D	Total/NA
Iron	1900		100	21	ug/L	1		6010C	Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
o-Xylene	8.4		4.0	4.0	ug/L	4		MAVPH	Total/NA
C5-C8 Aliphatics (unadjusted)	1500		200	200	ug/L	4		MAVPH	Total/NA
C5-C8 Aliphatics (adjusted)	1500		200	200	ug/L	4		MAVPH	Total/NA
Total VPH	1500		200	200	ug/L	4		MAVPH	Total/NA
Ammonia	0.25		0.10	0.10	mg/L	1		L107-06-1B	Total/NA
pH	6.87	HF	0.100	0.100	SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: OC-GW 79S — Lab Sample ID: 360-39434-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	16	J	100	13	ug/L	1		6010C	Dissolved
Chromium	5.6		5.0	0.66	ug/L	1		6010C	Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	1200		40	40	mg/L	20		300.0	Total/NA
Chloride	180		10	10	mg/L	10		300.0	Total/NA
Ammonia	140		2.0	2.0	mg/L	20		L107-06-1B	Total/NA
Specific Conductance	3000		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ 16RR — Lab Sample ID: 360-39434-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	5.3		5.0	0.66	ug/L	1		6010C	Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	740		20	20	mg/L	10		300.0	Total/NA
Chloride	130		10	10	mg/L	10		300.0	Total/NA
Ammonia	110		2.0	2.0	mg/L	20		L107-06-1B	Total/NA
Specific Conductance	2100		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-Trip Blank — Lab Sample ID: 360-39434-4

No Detections

Method Summary

Client: Olin Corporation
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds (GC/MS)	MA DEP	TAL WFD
8270D	Semivolatile Organic Compounds (GC/MS) Low Level	MA DEP	TAL WFD
MAVPH	Massachusetts - Volatile Petroleum Hydrocarbons (GC)	MA DEP	TAL WFD
6010C	Metals (ICP)	SW846	TAL WFD
300.0	Chloride & Sulfate	40CFR136A	TAL WFD
L107-06-1B	Nitrogen Ammonia	LACHAT	TAL WFD
SM 2510B	Conductivity, Specific Conductance	SM	TAL WFD
SM 4500 H+ B	pH	SM	TAL WFD

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater ", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
LACHAT = LACHAT
MA DEP = Massachusetts Department Of Environmental Protection
SM = "Standard Methods For The Examination Of Water And Wastewater",
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

Sample Summary

Client: Olin Corporation
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
360-39434-1	OC-GW 16R	Water	03/07/12 08:10	03/07/12 17:10
360-39434-2	OC-GW 79S	Water	03/07/12 10:00	03/07/12 17:10
360-39434-3	OC-PZ 16RR	Water	03/07/12 10:20	03/07/12 17:10
360-39434-4	OC-Trip Blank	Water	03/07/12 08:10	03/07/12 17:10

Client Sample ID: OC-GW 16R
Date Collected: 03/07/12 08:10
Date Received: 03/07/12 17:10

Lab Sample ID: 360-39434-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	**1200**		20	4.0	ug/L			03/12/12 13:32	20
2,4,4-Trimethyl-2-pentene	**360**		20	4.0	ug/L			03/12/12 13:32	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*103*		*70 - 130*		*03/12/12 13:32*	*20*
Toluene-d8 (Surr)	*100*		*70 - 130*		*03/12/12 13:32*	*20*
Dibromofluoromethane	*101*		*70 - 130*		*03/12/12 13:32*	*20*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		1.9	0.47	ug/L		03/08/12 15:24	03/09/12 15:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol	*29*		*15 - 110*	*03/08/12 15:24*	*03/09/12 15:22*	*1*
Phenol-d5	*23*		*15 - 110*	*03/08/12 15:24*	*03/09/12 15:22*	*1*
Nitrobenzene-d5	*61*		*30 - 130*	*03/08/12 15:24*	*03/09/12 15:22*	*1*
2,4,6-Tribromophenol	*92*		*15 - 110*	*03/08/12 15:24*	*03/09/12 15:22*	*1*
Terphenyl-d14	*93*		*30 - 130*	*03/08/12 15:24*	*03/09/12 15:22*	*1*
2-Fluorobiphenyl	*61*		*30 - 130*	*03/08/12 15:24*	*03/09/12 15:22*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodiphenylamine	**330**		94	9.4	ug/L		03/08/12 15:24	03/14/12 16:47	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol	*0*	*D X*	*15 - 110*	*03/08/12 15:24*	*03/14/12 16:47*	*20*
Phenol-d5	*0*	*D X*	*15 - 110*	*03/08/12 15:24*	*03/14/12 16:47*	*20*
Nitrobenzene-d5	*0*	*D X*	*30 - 130*	*03/08/12 15:24*	*03/14/12 16:47*	*20*
2,4,6-Tribromophenol	*0*	*D X*	*15 - 110*	*03/08/12 15:24*	*03/14/12 16:47*	*20*
Terphenyl-d14	*0*	*D X*	*30 - 130*	*03/08/12 15:24*	*03/14/12 16:47*	*20*
2-Fluorobiphenyl	*0*	*D X*	*30 - 130*	*03/08/12 15:24*	*03/14/12 16:47*	*20*

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		4.0	4.0	ug/L			03/20/12 01:18	4
Ethylbenzene	ND		4.0	4.0	ug/L			03/20/12 01:18	4
m-Xylene & p-Xylene	ND		8.0	8.0	ug/L			03/20/12 01:18	4
Methyl tert-butyl ether	ND		4.0	4.0	ug/L			03/20/12 01:18	4
Naphthalene	ND		20	20	ug/L			03/20/12 01:18	4
o-Xylene	**8.4**		4.0	4.0	ug/L			03/20/12 01:18	4
Toluene	ND		4.0	4.0	ug/L			03/20/12 01:18	4
C5-C8 Aliphatics (unadjusted)	**1500**		200	200	ug/L			03/20/12 01:18	4
C9-C12 Aliphatics (unadjusted)	ND		200	200	ug/L			03/20/12 01:18	4
C5-C8 Aliphatics (adjusted)	**1500**		200	200	ug/L			03/20/12 01:18	4
C9-C12 Aliphatics (adjusted)	ND		200	200	ug/L			03/20/12 01:18	4
C9-C10 Aromatics	ND		200	200	ug/L			03/20/12 01:18	4
Total VPH	**1500**		200	200	ug/L			03/20/12 01:18	4

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dibromotoluene (fid)	*100*		*70 - 130*		*03/20/12 01:18*	*4*
2,5-Dibromotoluene (pid)	*110*		*70 - 130*		*03/20/12 01:18*	*4*

Client: Olin Corporation
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

Client Sample ID: OC-GW 16R
Date Collected: 03/07/12 08:10
Date Received: 03/07/12 17:10

Lab Sample ID: 360-39434-1
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	1900		100	21	ug/L			03/13/12 15:34	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.25		0.10	0.10	mg/L		03/16/12 10:29	03/20/12 15:54	1
pH	6.87	HF	0.100	0.100	SU			03/09/12 09:29	1

Client: Olin Corporation
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

Client Sample ID: OC-GW 79S
Date Collected: 03/07/12 10:00
Date Received: 03/07/12 17:10

Lab Sample ID: 360-39434-2
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	16	J	100	13	ug/L			03/13/12 15:47	1
Chromium	5.6		5.0	0.66	ug/L			03/13/12 15:47	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1200		40	40	mg/L			03/16/12 22:40	20
Chloride	180		10	10	mg/L			03/16/12 03:05	10
Ammonia	140		2.0	2.0	mg/L		03/16/12 10:29	03/20/12 16:35	20
Specific Conductance	3000		1.0	1.0	umhos/cm			03/16/12 14:29	1

Client: Olin Corporation
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

Client Sample ID: OC-PZ 16RR
Date Collected: 03/07/12 10:20
Date Received: 03/07/12 17:10

Lab Sample ID: 360-39434-3
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/13/12 15:50	1
Chromium	**5.3**		5.0	0.66	ug/L			03/13/12 15:50	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**740**		20	20	mg/L			03/16/12 03:36	10
Chloride	**130**		10	10	mg/L			03/16/12 03:36	10
Ammonia	**110**		2.0	2.0	mg/L		03/16/12 10:29	03/20/12 16:36	20
Specific Conductance	**2100**		1.0	1.0	umhos/cm			03/16/12 14:30	1

Client: Olin Corporation
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

Client Sample ID: OC-Trip Blank
Date Collected: 03/07/12 08:10
Date Received: 03/07/12 17:10

Lab Sample ID: 360-39434-4
Matrix: Water

Method: 8260C - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	ND		1.0	0.20	ug/L			03/12/12 13:53	1
2,4,4-Trimethyl-2-pentene	ND		1.0	0.20	ug/L			03/12/12 13:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*101*		*70 - 130*		*03/12/12 13:53*	*1*
Toluene-d8 (Surr)	*102*		*70 - 130*		*03/12/12 13:53*	*1*
Dibromofluoromethane	*103*		*70 - 130*		*03/12/12 13:53*	*1*

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
D	Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution may be flagged with a D.
X	Surrogate is outside control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

QC Association Summary

Client: Olin Corporation
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

GC/MS VOA

Analysis Batch: 88289

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	8260C	
360-39434-4	OC-Trip Blank	Total/NA	Water	8260C	
LCS 360-88289/3	Lab Control Sample	Total/NA	Water	8260C	
LCSD 360-88289/4	Lab Control Sample Dup	Total/NA	Water	8260C	
MB 360-88289/6	Method Blank	Total/NA	Water	8260C	

GC/MS Semi VOA

Prep Batch: 88223

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	3510C	
360-39434-1 - DL	OC-GW 16R	Total/NA	Water	3510C	
LCS 360-88223/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 360-88223/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	
MB 360-88223/1-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 88264

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	8270D	88223
LCS 360-88223/2-A	Lab Control Sample	Total/NA	Water	8270D	88223
LCSD 360-88223/3-A	Lab Control Sample Dup	Total/NA	Water	8270D	88223
MB 360-88223/1-A	Method Blank	Total/NA	Water	8270D	88223

Analysis Batch: 88375

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1 - DL	OC-GW 16R	Total/NA	Water	8270D	88223

GC VOA

Analysis Batch: 88571

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	MAVPH	
360-39434-1 MS	OC-GW 16R	Total/NA	Water	MAVPH	
360-39434-1 MSD	OC-GW 16R	Total/NA	Water	MAVPH	
LCS 360-88571/3	Lab Control Sample	Total/NA	Water	MAVPH	
LCSD 360-88571/4	Lab Control Sample Dup	Total/NA	Water	MAVPH	
MB 360-88571/6	Method Blank	Total/NA	Water	MAVPH	

Metals

Analysis Batch: 88389

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Dissolved	Water	6010C	
360-39434-1 DU	OC-GW 16R	Dissolved	Water	6010C	
360-39434-1 MS	OC-GW 16R	Dissolved	Water	6010C	
360-39434-2	OC-GW 79S	Dissolved	Water	6010C	
360-39434-3	OC-PZ 16RR	Dissolved	Water	6010C	
LCS 360-88389/1	Lab Control Sample	Total/NA	Water	6010C	
LCSD 360-88389/10	Lab Control Sample Dup	Total/NA	Water	6010C	
MB 360-88389/2	Method Blank	Total/NA	Water	6010C	

General Chemistry

Analysis Batch: 88258

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	SM 4500 H+ B	
LCS 360-88258/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Prep Batch: 88493

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	Distill/Ammonia	
360-39434-2	OC-GW 79S	Total/NA	Water	Distill/Ammonia	
360-39434-3	OC-PZ 16RR	Total/NA	Water	Distill/Ammonia	
LCS 360-88493/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 360-88493/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 88521

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-2	OC-GW 79S	Total/NA	Water	SM 2510B	
360-39434-3	OC-PZ 16RR	Total/NA	Water	SM 2510B	
LCS 360-88521/1	Lab Control Sample	Total/NA	Water	SM 2510B	
MB 360-88521/3	Method Blank	Total/NA	Water	SM 2510B	

Analysis Batch: 88534

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-2	OC-GW 79S	Total/NA	Water	300.0	
360-39434-3	OC-PZ 16RR	Total/NA	Water	300.0	
LCS 360-88534/6	Lab Control Sample	Total/NA	Water	300.0	
MB 360-88534/5	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 88537

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-2	OC-GW 79S	Total/NA	Water	300.0	
LCS 360-88537/4	Lab Control Sample	Total/NA	Water	300.0	
MB 360-88537/3	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 88618

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39434-1	OC-GW 16R	Total/NA	Water	L107-06-1B	88493
360-39434-2	OC-GW 79S	Total/NA	Water	L107-06-1B	88493
360-39434-3	OC-PZ 16RR	Total/NA	Water	L107-06-1B	88493
LCS 360-88493/2-A	Lab Control Sample	Total/NA	Water	L107-06-1B	88493
MB 360-88493/1-A	Method Blank	Total/NA	Water	L107-06-1B	88493

Surrogate Summary

Client: Olin Corporation
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

Method: 8260C - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)
360-39434-1	OC-GW 16R	103	100	101
360-39434-4	OC-Trip Blank	101	102	103
LCS 360-88289/3	Lab Control Sample	102	104	105
LCSD 360-88289/4	Lab Control Sample Dup	102	104	103
MB 360-88289/6	Method Blank	103	100	103

Surrogate Legend

BFB = 4-Bromofluorobenzene
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		2FP	PHL	NBZ	TBP	TPH	FBP
Lab Sample ID	Client Sample ID	(15-110)	(15-110)	(30-130)	(15-110)	(30-130)	(30-130)
360-39434-1	OC-GW 16R	29	23	61	92	93	61
360-39434-1 - DL	OC-GW 16R	0 D X	0 D X	0 D X	0 D X	0 D X	0 D X
LCS 360-88223/2-A	Lab Control Sample	52	35	94	94	99	83
LCSD 360-88223/3-A	Lab Control Sample Dup	51	34	94	99	109	83
MB 360-88223/1-A	Method Blank	56	35	97	93	102	84

Surrogate Legend

2FP = 2-Fluorophenol
PHL = Phenol-d5
NBZ = Nitrobenzene-d5
TBP = 2,4,6-Tribromophenol
TPH = Terphenyl-d14
FBP = 2-Fluorobiphenyl

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		25DBT2	25DBT1
Lab Sample ID	Client Sample ID	(70-130)	(70-130)
360-39434-1	OC-GW 16R	100	110
360-39434-1 MS	OC-GW 16R	99	82
360-39434-1 MSD	OC-GW 16R	99	79
LCS 360-88571/3	Lab Control Sample	100	82
LCSD 360-88571/4	Lab Control Sample Dup	101	83
MB 360-88571/6	Method Blank	98	110

Surrogate Legend

25DBT = 2,5-Dibromotoluene (fid)

Method: 8260C - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 360-88289/6
Matrix: Water
Analysis Batch: 88289

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,4-Trimethyl-1-pentene	ND		1.0	0.20	ug/L			03/12/12 10:59	1
2,4,4-Trimethyl-2-pentene	ND		1.0	0.20	ug/L			03/12/12 10:59	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*103*		*70 - 130*		*03/12/12 10:59*	*1*
Toluene-d8 (Surr)	*100*		*70 - 130*		*03/12/12 10:59*	*1*
Dibromofluoromethane	*103*		*70 - 130*		*03/12/12 10:59*	*1*

Lab Sample ID: LCS 360-88289/3
Matrix: Water
Analysis Batch: 88289

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
2,4,4-Trimethyl-1-pentene			20.0	23.0		ug/L		115	70 - 130		
2,4,4-Trimethyl-2-pentene			20.0	22.9		ug/L		115	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*102*		*70 - 130*
Toluene-d8 (Surr)	*104*		*70 - 130*
Dibromofluoromethane	*105*		*70 - 130*

Lab Sample ID: LCSD 360-88289/4
Matrix: Water
Analysis Batch: 88289

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,4,4-Trimethyl-1-pentene			20.0	22.1		ug/L		111	70 - 130	4	20
2,4,4-Trimethyl-2-pentene			20.0	22.6		ug/L		113	70 - 130	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*102*		*70 - 130*
Toluene-d8 (Surr)	*104*		*70 - 130*
Dibromofluoromethane	*103*		*70 - 130*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level

Lab Sample ID: MB 360-88223/1-A
Matrix: Water
Analysis Batch: 88264

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 88223

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	1.11	J	2.0	0.50	ug/L		03/08/12 15:24	03/09/12 19:32	1
N-Nitrosodiphenylamine	ND		5.0	0.50	ug/L		03/08/12 15:24	03/09/12 19:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol	*56*		*15 - 110*	*03/08/12 15:24*	*03/09/12 19:32*	*1*
Phenol-d5	*35*		*15 - 110*	*03/08/12 15:24*	*03/09/12 19:32*	*1*
Nitrobenzene-d5	*97*		*30 - 130*	*03/08/12 15:24*	*03/09/12 19:32*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) Low Level (Continued)

Lab Sample ID: MB 360-88223/1-A
Matrix: Water
Analysis Batch: 88264

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 88223

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	93		15 - 110	03/08/12 15:24	03/09/12 19:32	1
Terphenyl-d14	102		30 - 130	03/08/12 15:24	03/09/12 19:32	1
2-Fluorobiphenyl	84		30 - 130	03/08/12 15:24	03/09/12 19:32	1

Lab Sample ID: LCS 360-88223/2-A
Matrix: Water
Analysis Batch: 88264

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 88223

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	8.00	8.25		ug/L		103	40 - 140
N-Nitrosodiphenylamine	8.00	7.71		ug/L		96	40 - 140

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorophenol	52		15 - 110
Phenol-d5	35		15 - 110
Nitrobenzene-d5	94		30 - 130
2,4,6-Tribromophenol	94		15 - 110
Terphenyl-d14	99		30 - 130
2-Fluorobiphenyl	83		30 - 130

Lab Sample ID: LCSD 360-88223/3-A
Matrix: Water
Analysis Batch: 88264

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 88223

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate	8.00	8.99		ug/L		112	40 - 140	9	20
N-Nitrosodiphenylamine	8.00	7.66		ug/L		96	40 - 140	1	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
2-Fluorophenol	51		15 - 110
Phenol-d5	34		15 - 110
Nitrobenzene-d5	94		30 - 130
2,4,6-Tribromophenol	99		15 - 110
Terphenyl-d14	109		30 - 130
2-Fluorobiphenyl	83		30 - 130

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC)

Lab Sample ID: MB 360-88571/6
Matrix: Water
Analysis Batch: 88571

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	1.0	ug/L			03/20/12 00:12	1
Ethylbenzene	ND		1.0	1.0	ug/L			03/20/12 00:12	1
m-Xylene & p-Xylene	ND		2.0	2.0	ug/L			03/20/12 00:12	1
Methyl tert-butyl ether	ND		1.0	1.0	ug/L			03/20/12 00:12	1
Naphthalene	ND		5.0	5.0	ug/L			03/20/12 00:12	1
o-Xylene	ND		1.0	1.0	ug/L			03/20/12 00:12	1

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: MB 360-88571/6
Matrix: Water
Analysis Batch: 88571

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	ND		1.0	1.0	ug/L			03/20/12 00:12	1
C5-C8 Aliphatics (unadjusted)	ND		50	50	ug/L			03/20/12 00:12	1
C9-C12 Aliphatics (unadjusted)	ND		50	50	ug/L			03/20/12 00:12	1
C5-C8 Aliphatics (adjusted)	ND		50	50	ug/L			03/20/12 00:12	1
C9-C12 Aliphatics (adjusted)	ND		50	50	ug/L			03/20/12 00:12	1
C9-C10 Aromatics	ND		50	50	ug/L			03/20/12 00:12	1
Total VPH	ND		50	50	ug/L			03/20/12 00:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dibromotoluene (fid)	*98*		*70 - 130*		*03/20/12 00:12*	*1*
2,5-Dibromotoluene (pid)	*110*		*70 - 130*		*03/20/12 00:12*	*1*

Lab Sample ID: LCS 360-88571/3
Matrix: Water
Analysis Batch: 88571

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	100	113		ug/L		113	70 - 130
Ethylbenzene	100	114		ug/L		114	70 - 130
m-Xylene & p-Xylene	200	194		ug/L		97	70 - 130
Methyl tert-butyl ether	100	105		ug/L		105	70 - 130
Naphthalene	100	114		ug/L		114	70 - 130
o-Xylene	100	109		ug/L		109	70 - 130
Toluene	100	110		ug/L		110	70 - 130
C5-C8 Aliphatics (unadjusted)	300	315		ug/L		105	70 - 130
C9-C12 Aliphatics (unadjusted)	300	266		ug/L		89	70 - 130
C9-C10 Aromatics	100	101		ug/L		101	70 - 130
Butylcyclohexane	100	87.5		ug/L		88	70 - 130
1,2,4-Trimethylbenzene	100	110		ug/L		110	70 - 130
2-Methylpentane	100	106		ug/L		106	70 - 130
Pentane	100	108		ug/L		108	70 - 130
n-Nonane	100	86.2		ug/L		86	30 - 130
n-Decane	100	87.7		ug/L		88	70 - 130
Isooctane	100	101		ug/L		101	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,5-Dibromotoluene (fid)	*100*		*70 - 130*
2,5-Dibromotoluene (pid)	*82*		*70 - 130*

Lab Sample ID: LCSD 360-88571/4
Matrix: Water
Analysis Batch: 88571

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	100	110		ug/L		110	70 - 130	3	25
Ethylbenzene	100	112		ug/L		112	70 - 130	2	25
m-Xylene & p-Xylene	200	189		ug/L		94	70 - 130	3	25
Methyl tert-butyl ether	100	104		ug/L		104	70 - 130	1	25
Naphthalene	100	114		ug/L		114	70 - 130	0	25

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: LCSD 360-88571/4
Matrix: Water
Analysis Batch: 88571

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
o-Xylene			100	107		ug/L		107	70 - 130	2	25
Toluene			100	108		ug/L		108	70 - 130	3	25
C5-C8 Aliphatics (unadjusted)			300	306		ug/L		102	70 - 130	3	25
C9-C12 Aliphatics (unadjusted)			300	277		ug/L		92	70 - 130	4	25
C9-C10 Aromatics			100	99.0		ug/L		99	70 - 130	2	25
Butylcyclohexane			100	90.2		ug/L		90	70 - 130	3	25
1,2,4-Trimethylbenzene			100	107		ug/L		107	70 - 130	2	25
2-Methylpentane			100	102		ug/L		102	70 - 130	3	25
Pentane			100	104		ug/L		104	70 - 130	4	25
n-Nonane			100	88.8		ug/L		89	30 - 130	3	25
n-Decane			100	94.4		ug/L		94	70 - 130	7	25
Isooctane			100	97.9		ug/L		98	70 - 130	3	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,5-Dibromotoluene (fid)	*101*		*70 - 130*
2,5-Dibromotoluene (pid)	*83*		*70 - 130*

Lab Sample ID: 360-39434-1 MS
Matrix: Water
Analysis Batch: 88571

Client Sample ID: OC-GW 16R
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene	ND		400	459		ug/L		115	70 - 130		
Ethylbenzene	ND		400	467		ug/L		117	70 - 130		
m-Xylene & p-Xylene	ND		800	769		ug/L		96	70 - 130		
Methyl tert-butyl ether	ND		400	411		ug/L		103	70 - 130		
Naphthalene	ND		400	447		ug/L		112	70 - 130		
o-Xylene	8.4		400	444		ug/L		109	70 - 130		
Toluene	ND		400	443		ug/L		111	70 - 130		
C5-C8 Aliphatics (unadjusted)	1500		1200	2920		ug/L		118	70 - 130		
C9-C12 Aliphatics (unadjusted)	ND		1200	1220		ug/L		102	70 - 130		
C9-C10 Aromatics	ND		400	462		ug/L		115	70 - 130		
Butylcyclohexane	ND		400	393		ug/L		98	70 - 130		
1,2,4-Trimethylbenzene	ND		400	443		ug/L		111	70 - 130		
2-Methylpentane	ND		400	424		ug/L		106	70 - 130		
Pentane	ND		400	432		ug/L		108	70 - 130		
n-Nonane	ND		400	392		ug/L		98	30 - 130		
n-Decane	ND		400	408		ug/L		102	70 - 130		
Isooctane	ND		400	416		ug/L		104	70 - 130		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2,5-Dibromotoluene (fid)	*99*		*70 - 130*
2,5-Dibromotoluene (pid)	*82*		*70 - 130*

Method: MAVPH - Massachusetts - Volatile Petroleum Hydrocarbons (GC) (Continued)

Lab Sample ID: 360-39434-1 MSD
Matrix: Water
Analysis Batch: 88571

Client Sample ID: OC-GW 16R
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	ND		400	452		ug/L		113	70 - 130	1	50
Ethylbenzene	ND		400	452		ug/L		113	70 - 130	3	50
m-Xylene & p-Xylene	ND		800	765		ug/L		96	70 - 130	1	50
Methyl tert-butyl ether	ND		400	400		ug/L		100	70 - 130	3	50
Naphthalene	ND		400	447		ug/L		112	70 - 130	0	50
o-Xylene	8.4		400	439		ug/L		108	70 - 130	1	50
Toluene	ND		400	438		ug/L		110	70 - 130	1	50
C5-C8 Aliphatics (unadjusted)	1500		1200	2990		ug/L		125	70 - 130	3	50
C9-C12 Aliphatics (unadjusted)	ND		1200	1230		ug/L		103	70 - 130	1	50
C9-C10 Aromatics	ND		400	451		ug/L		113	70 - 130	2	50
Butylcyclohexane	ND		400	395		ug/L		99	70 - 130	0	50
1,2,4-Trimethylbenzene	ND		400	438		ug/L		110	70 - 130	1	50
2-Methylpentane	ND		400	432		ug/L		108	70 - 130	2	50
Pentane	ND		400	440		ug/L		110	70 - 130	2	50
n-Nonane	ND		400	396		ug/L		99	30 - 130	1	50
n-Decane	ND		400	413		ug/L		103	70 - 130	1	50
Isooctane	ND		400	422		ug/L		105	70 - 130	1	50

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2,5-Dibromotoluene (fid)	*99*		*70 - 130*
2,5-Dibromotoluene (pid)	*79*		*70 - 130*

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 360-88389/2
Matrix: Water
Analysis Batch: 88389

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/13/12 15:31	1
Iron	ND		100	21	ug/L			03/13/12 15:31	1
Chromium	ND		5.0	0.66	ug/L			03/13/12 15:31	1

Lab Sample ID: LCS 360-88389/1
Matrix: Water
Analysis Batch: 88389

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	5000	5070		ug/L		101	80 - 120
Iron	5000	5040		ug/L		101	80 - 120
Chromium	1000	989		ug/L		99	80 - 120

Lab Sample ID: LCSD 360-88389/10
Matrix: Water
Analysis Batch: 88389

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	5000	5120		ug/L		102	80 - 120	1	20
Iron	5000	5100		ug/L		102	80 - 120	1	20

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCSD 360-88389/10
Matrix: Water
Analysis Batch: 88389

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium			1000	998		ug/L		100	80 - 120	1	20

Lab Sample ID: 360-39434-1 MS
Matrix: Water
Analysis Batch: 88389

Client Sample ID: OC-GW 16R
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Aluminum	ND		5000	5430		ug/L		109	75 - 125		
Iron	1900		5000	7190		ug/L		106	75 - 125		
Chromium	ND		1000	1040		ug/L		104	75 - 125		

Lab Sample ID: 360-39434-1 DU
Matrix: Water
Analysis Batch: 88389

Client Sample ID: OC-GW 16R
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Aluminum	ND		ND		ug/L				NC	20
Iron	1900		1910		ug/L				0.4	20
Chromium	ND		ND		ug/L				NC	20

Method: 300.0 - Chloride & Sulfate

Lab Sample ID: MB 360-88534/5
Matrix: Water
Analysis Batch: 88534

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0	2.0	mg/L			03/15/12 22:48	1
Chloride	ND		1.0	1.0	mg/L			03/15/12 22:48	1

Lab Sample ID: LCS 360-88534/6
Matrix: Water
Analysis Batch: 88534

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate			80.0	83.3		mg/L		104	85 - 115		
Chloride			40.0	41.3		mg/L		103	85 - 115		

Lab Sample ID: MB 360-88537/3
Matrix: Water
Analysis Batch: 88537

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0	2.0	mg/L			03/16/12 16:41	1
Chloride	ND		1.0	1.0	mg/L			03/16/12 16:41	1

Method: 300.0 - Chloride & Sulfate (Continued)

Lab Sample ID: LCS 360-88537/4
Matrix: Water
Analysis Batch: 88537

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	80.0	82.5		mg/L		103	85 - 115
Chloride	40.0	40.8		mg/L		102	85 - 115

Method: L107-06-1B - Nitrogen Ammonia

Lab Sample ID: MB 360-88493/1-A
Matrix: Water
Analysis Batch: 88618

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 88493

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.10	0.10	mg/L		03/16/12 10:29	03/20/12 15:47	1

Lab Sample ID: LCS 360-88493/2-A
Matrix: Water
Analysis Batch: 88618

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 88493

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	10.0	8.99		mg/L		90	90 - 110

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: MB 360-88521/3
Matrix: Water
Analysis Batch: 88521

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			03/16/12 14:24	1

Lab Sample ID: LCS 360-88521/1
Matrix: Water
Analysis Batch: 88521

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Specific Conductance	1410	1400		umhos/cm		99	85 - 115

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 360-88258/1
Matrix: Water
Analysis Batch: 88258

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	6.00	5.950		SU		99	90 - 110

DILUTION LOGS

TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 3/15/12

Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Serial Dilution				Comments
									Sample Aliquot 2	Units	Final Volume 2	Units	
AMB	3/15/12	3000	39559G1	50x	200	uL	10	mL					
			2										
			3										
			5										
			39434A2	10x	1	mL	10	mL					
			A3										
			39540B1	10x	1	mL	10	mL					
			2										
			3										

entries completed by day [new page each day]

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TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 3/16/12

Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Serial Dilution				Comments
									Sample Aliquot 2	Units	Final Volume 2	Units	
AMB	3/16/12	300.0	39529F16	10x	1	mL	10	mL					
			39434A2	20x	500	mL	10	mL					
			39540B4	10x	1	mL	10	mL					
			39584F10	10x	1	mL	10	mL					
			MS										
			MSD										

entries completed by day [new page each day]

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TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 03-12-12

Analyst Initials	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Serial Dilution				Comments
								Sample Aliquot 2	Units	Final Volume 2	Units	
TDH	8260	39473 -1	5x 50x	10	mL	50	mL	5	mL	50	mL	
↓	↓	39434 - 1	20x	2.5	↓	↓	↓					
		39412 - 2	10x	10								
↓	↓	↓ 7	4x	12.5	↓	↓	↓					
												3-12-12 TDH

entries completed by day [new page each day]

10/12/11cfr- removed date column

TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 3/14/12

Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Serial Dilution				Comments
									Sample Aliquot 2	Units	Final Volume 2	Units	
JG	3/14/12	8270 LL	39434-1	10X	100	µL	1000	µL					
↓	↓	↓	↓	20X	50	↓	↓	↓					
JG	3/14/12	8270 LL	39435-1	10X	100	µL	1000	µL					

3/14/12 JG

entries completed by day [new page each day]

TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 3-20-12

Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Serial Dilution				Comments
									Sample Aliquot 2	Units	Final Volume 2	Units	
RwE	3-20-12	NH3	394340 C2A	20X	500	µL	10	mL					
			C3A	20X									
			395400 C1A	10X	1	mL	10	mL					
			C2A	10X	1	mL							
			C3A	10X	1	mL							
			C4A	20X	500	µL							

RwE 3-20-12

entries completed by day [new page each day]

025e

TestAmerica Westfield

Analytical Dilution Preparation Log

Date: 3-19-12

Analyst Initials	Date	Method	LIMs Sample ID	Rpt'd Dil.	Sample Aliquot 1	Units	Final Volume 1	Units	Serial Dilution: Sample Aliquot 2	Serial Dilution: Units	Serial Dilution: Final Volume 2	Serial Dilution: Units	Comments
CMR	3-14-12	MAVPH	39434-1-1	4x	12.5	mL	50	mL					Foam
			39462-D-1	10X	5								Foam
			-D2	25X	2								odor
			-D3	10X	5								Foam
			-D4	25X	2								odor
			-D5	10X	5								Foam
			D6	10X	5								Foam
			D7	10X	5								Foam
			D8	10X	5								Foam
			D9	10X	5								Foam
			D11	10X	5								Foam
			D12	10X	5								odor
			D13	25X	2								
			D14	10X	5								
			D15	10X	5								
			D16	10X	5								
CMR	3-20-12	MAVPH	39434-1-1	4X	25	mL	100	mL					MS/MSD

entries completed by day [new page each day]

CMR 3-20-12

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

Client Sample ID: OC-GW 16R

Lab Sample ID: 360-39434-1

Date Collected: 03/07/12 08:10

Matrix: Water

Date Received: 03/07/12 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		20	88289	03/12/12 13:32	TH	TAL WFD
Total/NA	Prep	3510C			88223	03/08/12 15:24	TLV	TAL WFD
Total/NA	Analysis	8270D		1	88264	03/09/12 15:22	JLG	TAL WFD
Total/NA	Prep	3510C	DL		88223	03/08/12 15:24	TLV	TAL WFD
Total/NA	Analysis	8270D	DL	20	88375	03/14/12 16:47	JLG	TAL WFD
Total/NA	Analysis	MAVPH		4	88571	03/20/12 01:18	CMR	TAL WFD
Dissolved	Analysis	6010C		1	88389	03/13/12 15:34	TJS	TAL WFD
Total/NA	Analysis	SM 4500 H+ B		1	88258	03/09/12 09:29	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88493	03/16/12 10:29	AMS	TAL WFD
Total/NA	Analysis	L107-06-1B		1	88618	03/20/12 15:54	RWE	TAL WFD

Client Sample ID: OC-GW 79S

Lab Sample ID: 360-39434-2

Date Collected: 03/07/12 10:00

Matrix: Water

Date Received: 03/07/12 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		1	88389	03/13/12 15:47	TJS	TAL WFD
Total/NA	Analysis	SM 2510B		1	88521	03/16/12 14:29	GRB	TAL WFD
Total/NA	Analysis	300.0		10	88534	03/16/12 03:05	AMS	TAL WFD
Total/NA	Analysis	300.0		20	88537	03/16/12 22:40	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88493	03/16/12 10:29	AMS	TAL WFD
Total/NA	Analysis	L107-06-1B		20	88618	03/20/12 16:35	RWE	TAL WFD

Client Sample ID: OC-PZ 16RR

Lab Sample ID: 360-39434-3

Date Collected: 03/07/12 10:20

Matrix: Water

Date Received: 03/07/12 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		1	88389	03/13/12 15:50	TJS	TAL WFD
Total/NA	Analysis	SM 2510B		1	88521	03/16/12 14:30	GRB	TAL WFD
Total/NA	Analysis	300.0		10	88534	03/16/12 03:36	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88493	03/16/12 10:29	AMS	TAL WFD
Total/NA	Analysis	L107-06-1B		20	88618	03/20/12 16:36	RWE	TAL WFD

Client Sample ID: OC-Trip Blank

Lab Sample ID: 360-39434-4

Date Collected: 03/07/12 08:10

Matrix: Water

Date Received: 03/07/12 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	88289	03/12/12 13:53	TH	TAL WFD

Laboratory References:

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

Certification Summary

Client: Olin Corporation
Project/Site: Olin Chemical

TestAmerica Job ID: 360-39434-1

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Westfield	Connecticut	State Program	1	PH-0494
TestAmerica Westfield	Maine	State Program	1	MA00014
TestAmerica Westfield	Massachusetts	State Program	1	M-MA014
TestAmerica Westfield	New Hampshire	NELAC	1	2539
TestAmerica Westfield	New York	NELAC	2	10843
TestAmerica Westfield	Rhode Island	State Program	1	LAO00057
TestAmerica Westfield	Vermont	State Program	1	VT-10843

Accreditation may not be offered or required for all methods and analytes reported in this package . Please contact your project manager for the laboratory's current list of certified methods and analytes.

State Accreditation Matrix

Method Name	Description	Primary Accreditation	
		New Hampshire (NELAC)	Mass
180.1	Turbidity, Nephelometric	P	P
245.1	Mercury (CVAA)	NP/P	NP
300	Anions, Ion Chromatography	NP/P	NP/P
410.4	COD	NP	NP
524.2	Volatile Org Comp (GC/MS)(list upon request)	P	P
524.2	Trihalomethane compounds	P	P
608	Organochlorine Pest/PCBs (list upon request)	NP	NP
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP	NP
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW	
1103.1	E.coli		ambient/source
3546	Microwave Extraction	SW	
5035	Closed System Purge and Trap	SW	
6020	Metals (ICP/MS) (list upon request)	NP	
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P
200.8 Rev 5.4	Metals (ICP/MS) (list upon request)	NP/P	NP/P
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P	
3010A	Preparation, Total Metals	NP/P	
3020A	Preparation, Total Metals	NP/P	
3050B	Preparation, Metals	SW	
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP	
5030B	Purge and Trap	NP	
6010C	Metals (ICP)(list upon request)	NP/SW	
7196A	Chromium, Hexavalent	NP/SW	
7470A	Mercury (CVAA)	NP	
7471A	Mercury (CVAA)	SW	
8081B	Organochlorine Pesticides (GC)(list upon request)	NP/SW	
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW	
8260C	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW	
8270D	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW	
9012A	Cyanide, Total and/or Amenable	NP/SW	
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP	
9045C	pH	SW	
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)	NP/SW	
Enterolert	Enterococcus		ambient/source
L107041C	Nitrogen, Nitrate	NP	
L107-06-1B	Nitrogen Ammonia	NP	NP
L204001A CN	Cyanide, Total	P	NP/P
L210-001A	Phenolics, Total Recoverable	NP	NP
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)	NP/SW	
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)	NP/SW	
SM 2320B	Alkalinity	NP/P	NP/P
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P
SM 2540D	Solids, Total Suspended (TSS)	NP	NP
SM 3500 CR D	Chromium, Hexavalent	NP	
SM 4500 Cl F	Chlorine, Residual		NP
SM 4500 H+ B	pH	NP/P	NP/P
SM 4500 NO2 B	Nitrogen, Nitrite	NP	P
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP
SM 4500 P E	Phosphorus, Total	NP	NP
SM 4500 S2 D	Sulfide, Total	NP	
SM 5210B	BOD, 5-Day	NP	NP
SM 5310B	Organic Carbon, Total (TOC)	NP/P	NP
SM 9215E	Heterotrophic Plate Count (SimPlate)		P
SM 9222D	Coliforms, Fecal (Membrane Filter)		NP
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		P
SM 9223	Coliforms, Total, and E.Coli (Enumeration)		P

Not all organic compounds are accreditied under YNI
For methods with multiple compounds all compounds may not meet TNI criteria, a listing should be obtained from the laboratory

The lab carries additional accreditations with several states. This is the laboratories typcial listing but is subject to change based on the laboratories current certification standing.

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 360-39434-1

Login Number: 39434

List Source: TestAmerica Westfield

List Number: 1

Creator: Ard, Vanessa L

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	False	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	False	Received Trip Blank(s) not listed on COC.
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica Westfield
Westfield Executive Park 53 Southampton Road
Westfield, MA 01085
Phone (413) 572-4000 Fax (413) 572-3707

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Brian Guichard	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No: 360-10702.2
Client Contact: Mr. Brian Guichard	Phone:	E-Mail: becky.mason@testamericainc.com		Page: Page 2 of 2
Company: Olin Corporation		**Analysis Requested**		Job #:
Address: 51 Eames street	Due Date Requested:			
City: Wilington	TAT Requested (days):			
State, Zip: MA, 01887				
Phone:	PO #: REWI0013			
Email: beguichard@olin.com	WO #:			
Project Name: Olin Chemical Superfund Site	Project #: 36001816			
Site:	SSOW#:			

Preservation Codes:
A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA
M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2SO3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - ph 4-5; Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	LACH_107_06_1_B - Ammonia	6010B - (MOD) Custom Pick List Filtered	2810B, 300.0_28D	SM 4500 H+ pH	8260 MCP TMP only	MAVPH	8270 4 MCP 8270 open and BEHP only						Total Number of containers	Special Instructions/Note:
				Preservation Code:	X	X	S	D	N	?	A	A							X	
GW 16R	3-7-12	8:10	G	Water			2	2		2	8	6	4						24	
GW 79S	3-7-12	10:00	G	W			1	1	1										3	
PZ 16RR	3-7-12	10:20	G	W			1	1	1										3	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ______ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:		Time:		Method of Shipment:
Relinquished by: [signature]	Date/Time: 3-7-12 1330	Company	Received by: Jerry Dah[signature]	Date/Time: 3-7-12 1330	Company
Relinquished by: [signature]	Date/Time: 3-7-12 1710	Company	Received by: [signature]	Date/Time: 3/7/12 1710	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 2.6/1.6

3/21/2012

FILE COPY

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Westfield
Westfield Executive Park
53 Southampton Road
Westfield, MA 01085
Tel: (413)572-4000

CHECKED FOR COMPLETENESS OF PARAMETERS ORDERED BY:

TestAmerica Job ID: 360-39540-1
Client Project/Site: Olin Chemical Groundwater

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

Authorized for release by:
3/22/2012 9:16:08 AM
Joe Chimi
Report Production Representative
joe.chimi@testamericainc.com

Designee for

Becky Mason
Project Manager II
becky.mason@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Case Narrative

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Job ID: 360-39540-1

Laboratory: TestAmerica Westfield

Narrative

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

Receipt

The samples were received on 03/13/2012; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.2°C.

Metals

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No analytical or quality issues were noted.

General Chemistry

No analytical or quality issues were noted.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Westfield** Project #: **360-39540-1**

Project Location: **Olin Quarterly Groundwater** RTN:

This form provides certifications for the following data set: list Laboratory Sample ID Number(s):

360-39540-(1-4)

Matrices: [X] Groundwater/Surface Water [ ] Soil/Sediment [ ] Drinking Water [ ] Air [ ] Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A [ ]	7470/7471 Hg CAM III B [ ]	Mass DEP VPH CAM IV A [ ]	8081 Pesticides CAM V B [ ]	7196 Hex Cr CAM VI B [ ]	Mass DEP APH CAM IX A [ ]
8270 SVOC CAM II B [ ]	7010 Metals CAM III C [ ]	Mass DEP EPH CAM IV B [ ]	8151 Herbicides CAM V C [ ]	8330 Explosives CAM VIII A [ ]	TO-15 VOC CAM IX B [ ]
6010 Metals CAM III A [X]	6020 Metals CAM III D [ ]	8082 PCB CAM V A [ ]	9014 Total Cyanide/PAC CAM VI A [ ]	6860 Perchlorate CAM VIII B [ ]	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	[X] Yes [ ] No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	[X] Yes [ ] No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	[X] Yes [ ] No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	[X] Yes [ ] No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	[ ] Yes [ ] No [ ] Yes [ ] No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	[X] Yes [ ] No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

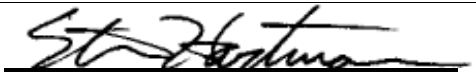
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	[X] Yes [ ] No[1]

***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	[X] Yes [ ] No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	[ ] Yes [X] No[1]

[1] All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature:  Position: Laboratory Director

Printed Name: Steven C. Hartmann Date: 3/22/12 9:10

This form has been electronically signed and approved

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Client Sample ID: OC-GW-78S — Lab Sample ID: 360-39540-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	5.1		5.0	0.66	ug/L	1		6010C	Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	490		20	20	mg/L	10		300.0	Total/NA
Chloride	27		1.0	1.0	mg/L	1		300.0	Total/NA
Ammonia	53		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1300		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-17-RR — Lab Sample ID: 360-39540-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	5.1		5.0	0.66	ug/L	1		6010C	Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	460		20	20	mg/L	10		300.0	Total/NA
Chloride	22		1.0	1.0	mg/L	1		300.0	Total/NA
Ammonia	53		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	1300		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW-25 — Lab Sample ID: 360-39540-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	3.1	J	5.0	0.66	ug/L	1		6010C	Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	100		20	20	mg/L	10		300.0	Total/NA
Chloride	69		10	10	mg/L	10		300.0	Total/NA
Ammonia	50		1.0	1.0	mg/L	10		L107-06-1B	Total/NA
Specific Conductance	660		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-PZ-18R — Lab Sample ID: 360-39540-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	14		5.0	0.66	ug/L	1		6010C	Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	790		20	20	mg/L	10		300.0	Total/NA
Chloride	290		10	10	mg/L	10		300.0	Total/NA
Ammonia	140		2.0	2.0	mg/L	20		L107-06-1B	Total/NA
Specific Conductance	2600		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Method Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL WFD
300.0	Chloride & Sulfate	40CFR136A	TAL WFD
L107-06-1B	Nitrogen Ammonia	LACHAT	TAL WFD
SM 2510B	Conductivity, Specific Conductance	SM	TAL WFD

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater ", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

Sample Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
360-39540-1	OC-GW-78S	Water	03/12/12 08:45	03/13/12 17:00
360-39540-2	OC-PZ-17-RR	Water	03/12/12 09:05	03/13/12 17:00
360-39540-3	OC-GW-25	Water	03/12/12 11:05	03/13/12 17:00
360-39540-4	OC-PZ-18R	Water	03/12/12 10:20	03/13/12 17:00

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Client Sample ID: OC-GW-78S
Date Collected: 03/12/12 08:45
Date Received: 03/13/12 17:00

Lab Sample ID: 360-39540-1
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/14/12 15:36	1
Chromium	**5.1**		5.0	0.66	ug/L			03/14/12 15:36	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**490**		20	20	mg/L			03/16/12 04:13	10
Chloride	**27**		1.0	1.0	mg/L			03/16/12 03:56	1
Ammonia	**53**		1.0	1.0	mg/L		03/19/12 11:49	03/20/12 16:40	10
Specific Conductance	**1300**		1.0	1.0	umhos/cm			03/16/12 14:37	1

Client Sample Results

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Client Sample ID: OC-PZ-17-RR
Date Collected: 03/12/12 09:05
Date Received: 03/13/12 17:00

Lab Sample ID: 360-39540-2
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/14/12 15:39	1
Chromium	**5.1**		5.0	0.66	ug/L			03/14/12 15:39	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**460**		20	20	mg/L			03/16/12 04:48	10
Chloride	**22**		1.0	1.0	mg/L			03/16/12 04:31	1
Ammonia	**53**		1.0	1.0	mg/L		03/19/12 11:49	03/20/12 16:41	10
Specific Conductance	**1300**		1.0	1.0	umhos/cm			03/16/12 14:39	1

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Client Sample ID: OC-GW-25
Date Collected: 03/12/12 11:05
Date Received: 03/13/12 17:00

Lab Sample ID: 360-39540-3
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/14/12 15:42	1
Chromium	**3.1**	**J**	5.0	0.66	ug/L			03/14/12 15:42	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**100**		20	20	mg/L			03/16/12 05:22	10
Chloride	**69**		10	10	mg/L			03/16/12 05:22	10
Ammonia	**50**		1.0	1.0	mg/L		03/19/12 11:49	03/20/12 16:41	10
Specific Conductance	**660**		1.0	1.0	umhos/cm			03/16/12 14:45	1

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Client Sample ID: OC-PZ-18R
Date Collected: 03/12/12 10:20
Date Received: 03/13/12 17:00

Lab Sample ID: 360-39540-4
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/14/12 15:45	1
Chromium	**14**		5.0	0.66	ug/L			03/14/12 15:45	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**790**		20	20	mg/L			03/16/12 23:15	10
Chloride	**290**		10	10	mg/L			03/16/12 23:15	10
Ammonia	**140**		2.0	2.0	mg/L		03/19/12 11:49	03/20/12 16:42	20
Specific Conductance	**2600**		1.0	1.0	umhos/cm			03/16/12 14:48	1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Metals

Analysis Batch: 88431

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39540-1	OC-GW-78S	Dissolved	Water	6010C	
360-39540-2	OC-PZ-17-RR	Dissolved	Water	6010C	
360-39540-3	OC-GW-25	Dissolved	Water	6010C	
360-39540-4	OC-PZ-18R	Dissolved	Water	6010C	
LCS 360-88431/17	Lab Control Sample	Total/NA	Water	6010C	
LCSD 360-88431/22	Lab Control Sample Dup	Total/NA	Water	6010C	
MB 360-88431/18	Method Blank	Total/NA	Water	6010C	

General Chemistry

Analysis Batch: 88521

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39540-1	OC-GW-78S	Total/NA	Water	SM 2510B	
360-39540-2	OC-PZ-17-RR	Total/NA	Water	SM 2510B	
360-39540-3	OC-GW-25	Total/NA	Water	SM 2510B	
360-39540-3 DU	OC-GW-25	Total/NA	Water	SM 2510B	
360-39540-4	OC-PZ-18R	Total/NA	Water	SM 2510B	
LCS 360-88521/1	Lab Control Sample	Total/NA	Water	SM 2510B	
MB 360-88521/3	Method Blank	Total/NA	Water	SM 2510B	

Prep Batch: 88533

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39540-1	OC-GW-78S	Total/NA	Water	Distill/Ammonia	
360-39540-2	OC-PZ-17-RR	Total/NA	Water	Distill/Ammonia	
360-39540-3	OC-GW-25	Total/NA	Water	Distill/Ammonia	
360-39540-4	OC-PZ-18R	Total/NA	Water	Distill/Ammonia	
LCS 360-88533/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 360-88533/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 88534

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39540-1	OC-GW-78S	Total/NA	Water	300.0	
360-39540-1	OC-GW-78S	Total/NA	Water	300.0	
360-39540-2	OC-PZ-17-RR	Total/NA	Water	300.0	
360-39540-2	OC-PZ-17-RR	Total/NA	Water	300.0	
360-39540-3	OC-GW-25	Total/NA	Water	300.0	
LCS 360-88534/6	Lab Control Sample	Total/NA	Water	300.0	
MB 360-88534/5	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 88537

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39540-4	OC-PZ-18R	Total/NA	Water	300.0	
LCS 360-88537/4	Lab Control Sample	Total/NA	Water	300.0	
MB 360-88537/3	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 88627

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
360-39540-1	OC-GW-78S	Total/NA	Water	L107-06-1B	88533
360-39540-2	OC-PZ-17-RR	Total/NA	Water	L107-06-1B	88533
360-39540-3	OC-GW-25	Total/NA	Water	L107-06-1B	88533
360-39540-4	OC-PZ-18R	Total/NA	Water	L107-06-1B	88533
LCS 360-88533/2-A	Lab Control Sample	Total/NA	Water	L107-06-1B	88533

General Chemistry (Continued)

Analysis Batch: 88627 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 360-88533/1-A	Method Blank	Total/NA	Water	L107-06-1B	88533

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 360-88431/18
Matrix: Water
Analysis Batch: 88431

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		100	13	ug/L			03/14/12 13:13	1
Chromium	ND		5.0	0.66	ug/L			03/14/12 13:13	1

Lab Sample ID: LCS 360-88431/17
Matrix: Water
Analysis Batch: 88431

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	5000	5060		ug/L		101	80 - 120
Chromium	1000	1000		ug/L		100	80 - 120

Lab Sample ID: LCSD 360-88431/22
Matrix: Water
Analysis Batch: 88431

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	5000	5170		ug/L		103	80 - 120	2	20
Chromium	1000	1020		ug/L		102	80 - 120	2	20

Method: 300.0 - Chloride & Sulfate

Lab Sample ID: MB 360-88534/5
Matrix: Water
Analysis Batch: 88534

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0	2.0	mg/L			03/15/12 22:48	1
Chloride	ND		1.0	1.0	mg/L			03/15/12 22:48	1

Lab Sample ID: LCS 360-88534/6
Matrix: Water
Analysis Batch: 88534

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	80.0	83.3		mg/L		104	85 - 115
Chloride	40.0	41.3		mg/L		103	85 - 115

Lab Sample ID: MB 360-88537/3
Matrix: Water
Analysis Batch: 88537

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		2.0	2.0	mg/L			03/16/12 16:41	1
Chloride	ND		1.0	1.0	mg/L			03/16/12 16:41	1

Lab Sample ID: LCS 360-88537/4
Matrix: Water
Analysis Batch: 88537

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	80.0	82.5		mg/L		103	85 - 115

Method: 300.0 - Chloride & Sulfate (Continued)

Lab Sample ID: LCS 360-88537/4
Matrix: Water
Analysis Batch: 88537

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			40.0	40.8		mg/L		102	85 - 115		

Method: L107-06-1B - Nitrogen Ammonia

Lab Sample ID: MB 360-88533/1-A
Matrix: Water
Analysis Batch: 88627

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 88533

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.10	0.10	mg/L		03/19/12 11:49	03/20/12 16:11	1

Lab Sample ID: LCS 360-88533/2-A
Matrix: Water
Analysis Batch: 88627

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 88533

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Ammonia			10.0	10.4		mg/L		104	90 - 110		

Method: SM 2510B - Conductivity, Specific Conductance

Lab Sample ID: MB 360-88521/3
Matrix: Water
Analysis Batch: 88521

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		1.0	1.0	umhos/cm			03/16/12 14:24	1

Lab Sample ID: LCS 360-88521/1
Matrix: Water
Analysis Batch: 88521

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Specific Conductance			1410	1400		umhos/cm		99	85 - 115		

Lab Sample ID: 360-39540-3 DU
Matrix: Water
Analysis Batch: 88521

Client Sample ID: OC-GW-25
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Specific Conductance	660			659		umhos/cm				0.3	20

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Client Sample ID: OC-GW-78S

Lab Sample ID: 360-39540-1

Date Collected: 03/12/12 08:45

Matrix: Water

Date Received: 03/13/12 17:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		1	88431	03/14/12 15:36	TJS	TAL WFD
Total/NA	Analysis	SM 2510B		1	88521	03/16/12 14:37	GRB	TAL WFD
Total/NA	Analysis	300.0		1	88534	03/16/12 03:56	AMS	TAL WFD
Total/NA	Analysis	300.0		10	88534	03/16/12 04:13	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88533	03/19/12 11:49	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	88627	03/20/12 16:40	RWE	TAL WFD

Client Sample ID: OC-PZ-17-RR

Lab Sample ID: 360-39540-2

Date Collected: 03/12/12 09:05

Matrix: Water

Date Received: 03/13/12 17:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		1	88431	03/14/12 15:39	TJS	TAL WFD
Total/NA	Analysis	SM 2510B		1	88521	03/16/12 14:39	GRB	TAL WFD
Total/NA	Analysis	300.0		1	88534	03/16/12 04:31	AMS	TAL WFD
Total/NA	Analysis	300.0		10	88534	03/16/12 04:48	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88533	03/19/12 11:49	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	88627	03/20/12 16:41	RWE	TAL WFD

Client Sample ID: OC-GW-25

Lab Sample ID: 360-39540-3

Date Collected: 03/12/12 11:05

Matrix: Water

Date Received: 03/13/12 17:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		1	88431	03/14/12 15:42	TJS	TAL WFD
Total/NA	Analysis	SM 2510B		1	88521	03/16/12 14:45	GRB	TAL WFD
Total/NA	Analysis	300.0		10	88534	03/16/12 05:22	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88533	03/19/12 11:49	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		10	88627	03/20/12 16:41	RWE	TAL WFD

Client Sample ID: OC-PZ-18R

Lab Sample ID: 360-39540-4

Date Collected: 03/12/12 10:20

Matrix: Water

Date Received: 03/13/12 17:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		1	88431	03/14/12 15:45	TJS	TAL WFD
Total/NA	Analysis	SM 2510B		1	88521	03/16/12 14:48	GRB	TAL WFD
Total/NA	Analysis	300.0		10	88537	03/16/12 23:15	AMS	TAL WFD
Total/NA	Prep	Distill/Ammonia			88533	03/19/12 11:49	RWE	TAL WFD
Total/NA	Analysis	L107-06-1B		20	88627	03/20/12 16:42	RWE	TAL WFD

Laboratory References:

TAL WFD = TestAmerica Westfield, Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085, TEL (413)572-4000

Certification Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater

TestAmerica Job ID: 360-39540-1

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Westfield	Connecticut	State Program	1	PH-0494
TestAmerica Westfield	Maine	State Program	1	MA00014
TestAmerica Westfield	Massachusetts	State Program	1	M-MA014
TestAmerica Westfield	New Hampshire	NELAC	1	2539
TestAmerica Westfield	New York	NELAC	2	10843
TestAmerica Westfield	Rhode Island	State Program	1	LAO00057
TestAmerica Westfield	Vermont	State Program	1	VT-10843

Accreditation may not be offered or required for all methods and analytes reported in this package . Please contact your project manager for the laboratory's current list of certified methods and analytes.

State Accreditation Matrix

Method Name	Description	Primary Accreditation	
		New Hampshire (NELAC)	Mass
180.1	Turbidity, Nephelometric	P	P
245.1	Mercury (CVAA)	NP/P	NP
300	Anions, Ion Chromatography	NP/P	NP/P
410.4	COD	NP	NP
524.2	Volatile Org Comp (GC/MS)(list upon request)	P	P
524.2	Trihalomethane compounds	P	P
608	Organochlorine Pest/PCBs (list upon request)	NP	NP
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP	NP
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW	
1103.1	E.coli		ambient/source
3546	Microwave Extraction	SW	
5035	Closed System Purge and Trap	SW	
6020	Metals (ICP/MS) (list upon request)	NP	
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P
200.8 Rev 5.4	Metals (ICP/MS) (list upon request)	NP/P	NP/P
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P	
3010A	Preparation, Total Metals	NP/P	
3020A	Preparation, Total Metals	NP/P	
3050B	Preparation, Metals	SW	
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP	
5030B	Purge and Trap	NP	
6010C	Metals (ICP)(list upon request)	NP/SW	
7196A	Chromium, Hexavalent	NP/SW	
7470A	Mercury (CVAA)	NP	
7471A	Mercury (CVAA)	SW	
8081B	Organochlorine Pesticides (GC)(list upon request)	NP/SW	
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW	
8260C	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW	
8270D	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW	
9012A	Cyanide, Total and/or Amenable	NP/SW	
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP	
9045C	pH	SW	
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)	NP/SW	
Enterolert	Enterococcus		ambient/source
L107041C	Nitrogen, Nitrate	NP	
L107-06-1B	Nitrogen Ammonia	NP	NP
L204001A CN	Cyanide, Total	P	NP/P
L210-001A	Phenolics, Total Recoverable	NP	NP
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)	NP/SW	
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)	NP/SW	
SM 2320B	Alkalinity	NP/P	NP/P
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P
SM 2540D	Solids, Total Suspended (TSS)	NP	NP
SM 3500 CR D	Chromium, Hexavalent	NP	
SM 4500 Cl F	Chlorine, Residual		NP
SM 4500 H+ B	pH	NP/P	NP/P
SM 4500 NO2 B	Nitrogen, Nitrite	NP	P
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP
SM 4500 P E	Phosphorus, Total	NP	NP
SM 4500 S2 D	Sulfide, Total	NP	
SM 5210B	BOD, 5-Day	NP	NP
SM 5310B	Organic Carbon, Total (TOC)	NP/P	NP
SM 9215E	Heterotrophic Plate Count (SimPlate)		P
SM 9222D	Coliforms, Fecal (Membrane Filter)		NP
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		P
SM 9223	Coliforms, Total, and E.Coli (Enumeration)		P

Not all organic compounds are accreditied under YNI
For methods with multiple compounds all compounds may not meet TNI criteria, a listing should be obtained from the laboratory

The lab carries additional accreditations with several states. This is the laboratories typcial listing but is subject to change based on the laboratories current certification standing.

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 360-39540-1

Login Number: 39540

List Source: TestAmerica Westfield

List Number: 1

Creator: Ard, Vanessa L

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	False	IDs on containers do not match the COC forr sample 4
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica Westfield
Westfield Executive Park 53 Southampton Road
Westfield, MA 01085
Phone (413) 572-4000 Fax (413) 572-3707

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Brian Guichard	Lab PM: Mason, Becky C	Carrier Tracking No(s):	COC No:
Client Contact: James Cashwell	Phone:	E-Mail: becky.mason@testamericainc.com		Page:
Company: Olin Corporation				Job #:
Address: 51 Eames Street	Due Date Requested:			
City: Wilington	TAT Requested (days):			
State, Zip: MA, 01887				
Phone:	PO #: REWI0013			
Email: beguichard@olin.com	WO #:			
Project Name: Olin Quarterly Groundwater	Project #: 36001816			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	LACH_107_06_1_B - Ammonia	6010B - Field filtered Al/Cr	2510B Spec. Cond., 300.0_28D SO4/Cl	Total Number of containers	Special Instructions/Note:
			Preservation Code:				S	D	N		
GW-78S	3/12/12	8:45	G	Water	Y		X	X	X	3	MCP
PZ-17-RR	3/12/12	9:05	G	Water	Y		X	X	X	3	
GW-25	3/12/12	11:05	G	Water	Y		X	X	X	3	
OC-GW-78S	3/12/12	10:20	G	Water	Y		X	X	X	3	
										3	
										3	
										3	
										3	
										3	

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1		3-13-12 1150			3/13/12 11:50	T.A.C.
2		3/13/12 1400			3-13-12 1400	
3		3-13-12 1700	TAL		3/13/12 1700	TAL

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 0.2/LL